**UNITED STATES DEPARTMENT OF AGRICULTURE**
**Forest Service**

# Turkey Cove Ruffed Grouse Habitat Improvement Project

## Environmental Assessment

**Clinch Ranger District, George Washington and Jefferson National Forests**

**Lee and Wise Counties, Virginia**

**May 2019**


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## Introduction

The Turkey Cove Ruffed Grouse Habitat Improvement Project is a vegetation management project located mostly within Lee County, Virginia with a small part within Wise County. The project area is approximately 4,730 acres in size and generally located directly southwest of the town of Big Stone Gap. It is within the Upper North Fork of the Clinch River (HUC 12) watershed and the Butcher Fork-South Fork of the Powell River (HUC 12) watershed. The project is located within the Big Stone Gap and Keokee topographic quadrangle maps. The following map (Figure 1) identifies the project area location.

This project is designed based on the vegetation management objectives of the *Revised Land and Resource Management Plan Jefferson National Forest* (hereinafter referred to as the Forest Plan) (USDA Forest Service, 2004a) with a focus on the Management Prescription 8E1-Ruffed Grouse /Woodcock Habitat Emphasis areas (Forest Plan, pp. 3-125 through 3-128). This management prescription area emphasizes providing optimal habitat for the ruffed grouse, an economically important small game bird that has experienced population declines throughout its range.

The project area lies in the Clinch River Management Area (Forest Plan pp. 4-29), with a relatively small part in the Powell River / Stone Mountain Management Areas (Forest Plan pp.4-32), and includes the following management prescriptions (see Figure 2):

- 8E1 Ruffed Grouse/Woodcock Habitat Emphasis
- 7B Scenic Corridors
- 11 Riparian Corridors
- 6A Old-growth Forest Communities not Associated with Disturbance
- 9A1 Source Watershed Protection.

The last two management prescriptions, 6A and 9A1, comprise a small part (less than 3 percent) of the project area.

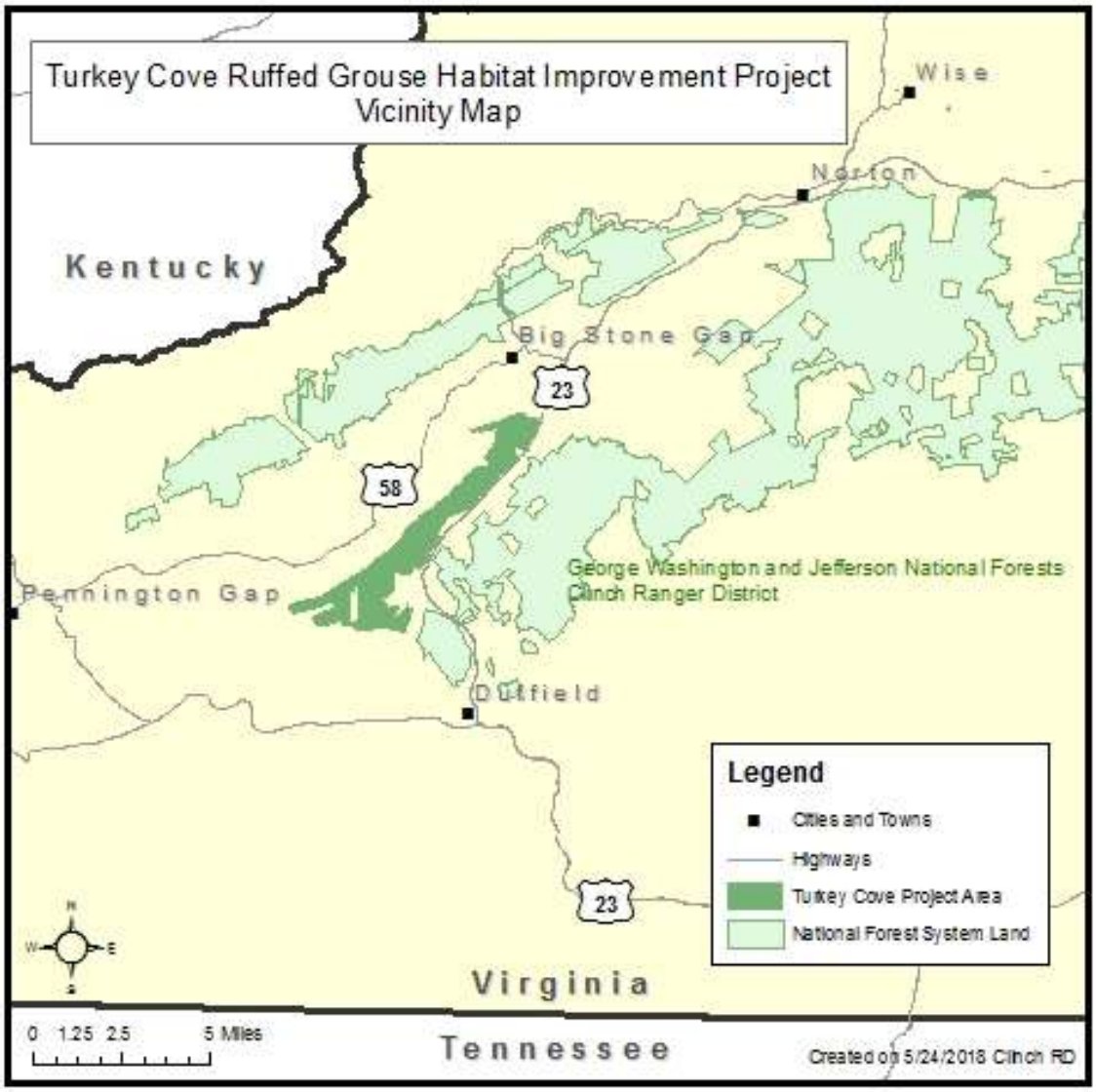


**Figure 1. Turkey Cove project location**

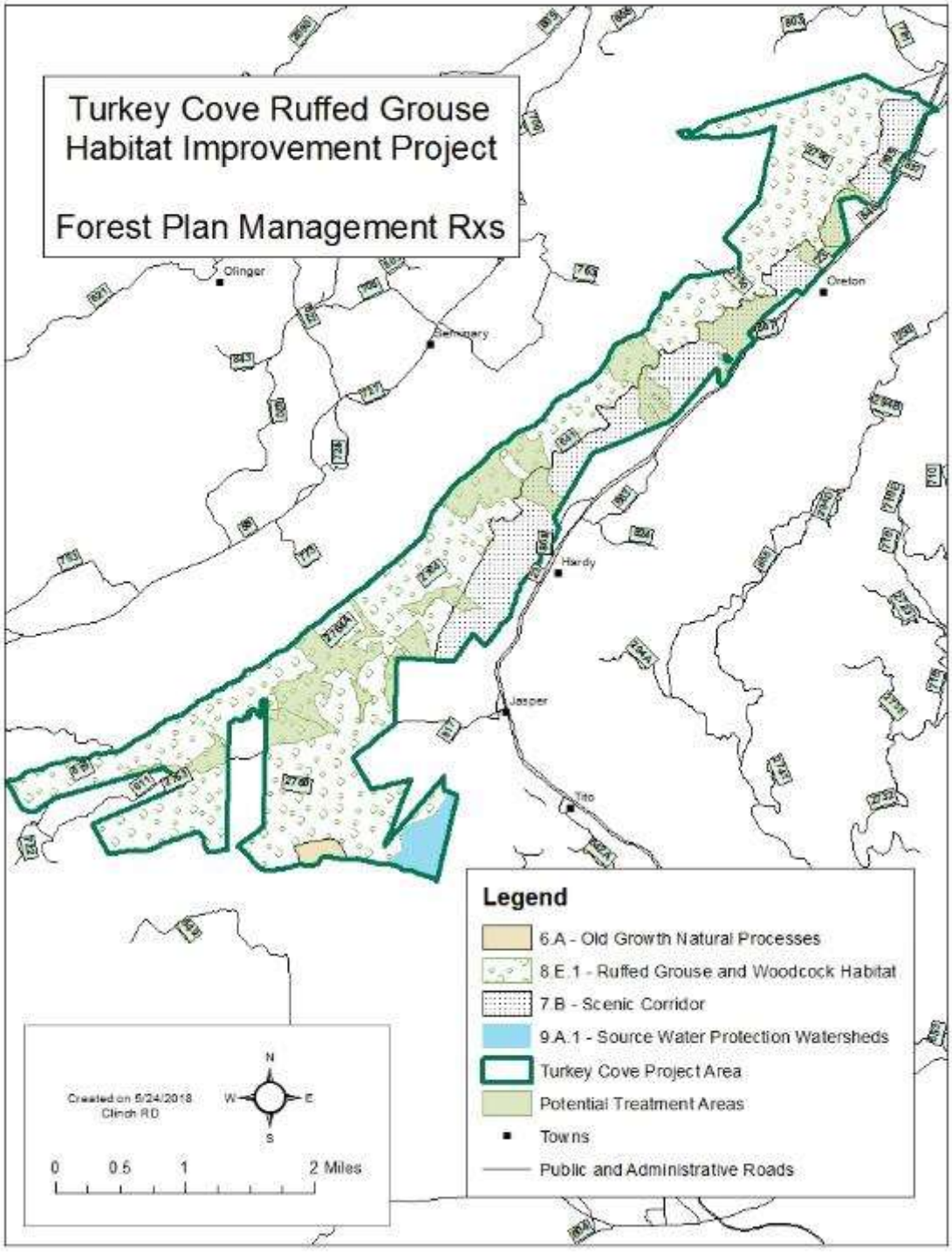


**Figure 2. Forest Plan prescriptions in the project area**

## Purpose and Need

The Forest Plan identifies desired conditions and objectives at both the Forest-wide and management prescription levels. The Purpose and Need for this project is driven by addressing the difference between the existing conditions and the desired conditions. The purpose of this proposal is to:

- Create and enhance terrestrial, riparian, and aquatic wildlife habitat, with a focus on ruffed grouse and woodcock habitat.
- Maintain a mix of tree species, balanced age class distribution and function.
- Harvest wood products and contribute to markets by implementing the goals and objectives of the Forest Plan.

### Create and Enhance Wildlife Habitat

*Existing Condition*: Less than one percent of the project area is within the early successional habitat (age 1-10 years) needed for optimum ruffed grouse (*Bonasa umbellus*) and woodcock (*Scolopax spp.*) habitat. Many mixed hardwood and hardwood-pine forest types in the project area are gradually converting towards later successional shade tolerant species, such as red maple (*Acer rubrum*). Large tracts of contiguous mature forest are in closed canopy conditions, narrowing the diversity of wildlife habitat. Some areas where early successional, shade intolerant yellow pine [1] existed are converting to hardwood-only forest. In other areas, where mid-successional oak species are dominant, oak are being replaced with longer living, shade tolerant species such as red maple.

*Desired Condition:*

- A mix of forest communities is sustained with diverse composition and stocking within the project area, contributing to the establishment of shrubs and grasses needed by ruffed grouse and woodcock and maintaining the long-term scenic integrity within the scenic corridor.
- A mix of successional stages, including ten percent in early successional habitat, is dispersed throughout the project area.
- Human-caused disturbances or modifications that cause environmental degradation through concentrated runoff, soil erosion, or sediment transport to the channel or water body are rehabilitated or mitigated to reduce or eliminate impacts; rehabilitation may be necessary to protect resource values and facilitate recovery of riparian structure and functions

*Need:* In order to improve wildlife habitat for ruffed grouse and woodcock, contribute to wildlife-based recreational opportunities (e.g., wildlife viewing, hunting), and benefit other

[1] Yellow pine refers to a number of species and within the project area can include shortleaf pine (*Pinus echinata*), Virginia pine (*Pinus virginiana*), or pitch pine (*Pinus rigida*).

wildlife species that rely on young forests including, but not limited to, white-tailed deer (*Odocoileus virginianus*) and golden-winged warbler (*Vermivora chrysoptera*), there is a need to:

- Maintain or increase pine stands to provide winter thermal cover (Forest Plan Standard 8E1-005);
- Manage for a diversity of oak species to minimize yearly fluctuation in acorn supplies (Forest Plan Standard 8E1-014);
- Minimize the occurrence of pest problems by managing host-type conditions. Suppression of pests, both non-native and native, is accomplished with all available integrated pest management tool (Forest Plan Standard 8E1-015);
- Create and maintain a minimum of ten percent of the 8E1 prescription area in early-successional forest habitat conditions (stand age less than ten years, openings five acres in size and greater) (Forest Plan Objective 8E1-OBJ1); and
- Progress towards maintaining up to two percent of the riparian corridor in early-successional forest habitat conditions in openings two to five acres in size (Forest Plan Objective 8E1-OBJ3).

The contiguous 8E1 management prescription in the project area totals 3,356 acres. This means that at least 336 acres of new regeneration would be necessary within the contiguous management prescription to meet Forest Plan Objective 8E1-OBJ1.

**Table 1. Existing Successional Habitats within Management Prescription 8E1**

| Successional Habitat | Acres | Percent |
|---|---|---|
| Early (0-10 yrs.) | 49 | < 1% |
| Sapling/Pole (11-40 yrs.) | 597 | 13% |
| Mid (41-80 yrs.) | 1,402 | 30% |
| Late Successional<br>(80-129 or 139 yrs. depending on forest community type) | 2,683 | 57% |
| Old Growth<br>(130 or 140+ yrs. depending on forest community type) | 0 | 0% |
| **Total** | **4,730** | **100%** [2] |

### Maintain a Mix of Tree Species, Age Class Distribution, and Function

*Existing Condition:* Overstocked forest conditions exhibiting reduced growth rates exist in the project area and are susceptible to insect and disease infestations. Competition for sun, water and nutrients is reducing the growth of the trees and reducing the regeneration of early successional yellow pines and other mast producing species. Non-native, invasive plants, such as autumn

[2] Percentages add up to 101% due to rounding

olive (*Elaeagnus umbellate*), multiflora rose (*Rosa multiflora*), tree-of-heaven (*Ailanthus altissima*), and royal paulownia (*Paulownia tomentosa*) are found within the project area.

*Desired Condition:* A resilient ecosystem characterized by overall structural heterogeneity across the project area. Growth rates begin to rise. Regeneration of pines and mast producing species such as oaks frequently occur on appropriate sites. The presence and spread of non-native, invasive plants is limited. Within the scenic corridors, forest management activities maintain the natural characteristics that make the area scenic. Up to four percent of forested land may be in early-successional forest conditions created both naturally and purposefully to create visually diverse vegetation stages compatible with scenic values.

*Need:* To manage forest ecosystems to maintain or restore composition (mix of species), structure (age class distribution), function (resulting benefits to the ecosystem and humans), and aesthetic values (scenic integrity) within desired ranges of variability, there is a need to:

- Decrease the existence of non-native invasive species such as autumn olive, multiflora rose, tree-of-heaven, and royal paulownia within the project area (Forest Plan Goal 14);
- Provide for structural diversity by balancing the age class distribution (Forest Plan Goal 12) while simultaneously maintaining a minimum of ten percent of the area in late-successional to old growth forest conditions greater than 100 years of age (Forest Plan Objective 8E1-OBJ2);
- Lessen competition to desired soft and hard mast producing species from shade tolerant species (Forest Plan Goal 12);
- Increase the amount of sunlight reaching the ground which will encourage the advancement of intermediate shade tolerant and shade intolerant regeneration which is valuable for timber and wildlife resource objectives (Forest Plan Goal 12); and
- Reduce stand density of trees to improve growth and enhance forest health (Forest Plan Goal 12)

### Harvest Wood Products and Contribute to Markets

*Existing Condition:* The entire project area is located on lands classified as suitable for timber production. [3]

*Desired Condition:* Project harvest activities maintain or move towards meeting the purpose and need (as outlined above) and result in the sale of marketable wood products, including biomass.

[3] Lands identified as suitable for timber production includes a planned periodic harvest applying biological and scientific principles to influence tree-species composition, control stocking, ensure adequate reforestation, facilitate harvesting of trees and protect the productivity of the site while providing for a healthy vigorous forest within the growth capabilities of the sites (Forest Plan pp. 2-30).

*Need:* There is a need for a periodic harvest to meet the goals and objectives established in the Forest Plan to:

- Provide a stable supply of wood products for local needs where forest management activities are needed and appropriate to achieve the desired composition, structure, function, productivity, and sustainability of forest ecosystems (Forest Plan Goal 15);
- Contribute to the total timber sale program of 4.0 million cubic feet (MMCF) [22 million board feet (MMBF)] annually (Forest Plan Objective 15.01); and
- Provide sawtimber products from sites with a site index of 70 or better when compatible with desired condition of the appropriate management prescription (Forest Plan Objective 16.01).

## Public Involvement

The Turkey Cove project first appeared on the Clinch Ranger District's quarterly Schedule of Proposed Actions (SOPA) in the third quarter of fiscal year 2018 as the Turkey Cove Ruffed Grouse Habitat Improvement Project and has appeared on the schedule as such since that time.

Scoping was conducted by the District Interdisciplinary Team (ID Team) to gather information about the project area and to identify the issues and concerns related to the proposed action. Scoping letters were mailed on May 30, 2018 to interested and affected agencies, organizations, and individuals informing them of the preliminary proposal and requesting their input. Eighteen letters were received in response to this initial scoping. Additionally, two public meetings were held June 15, 2018. Comments were classified into the following categories described in the Issues section below and were considered in the development of the proposed action.

The comment period for the Draft EA ran from February 22nd through March 25th of 2019. Eight comments letters were received from interested parties; responses to relevant comments have been compiled in the Turkey Cove Response to Comments document (TurkeyCoveResponseToComments.pdf) posted on the project website (https://www.fs.usda.gov/project/?project=37322).

## Issues

Input gathered from all sources during the comment period was evaluated by the ID Team for relevance to the project. Some of the comments were determined to be not relevant (non-substantive) to the project because they are:

a) Beyond the scope of the proposal;
b) Unrelated to the decision being made;
c) Already decided by law, regulation or policy;
d) Conjectural in nature or not supported by scientific evidence; or,
e) General in nature (not specific to this project) or position statements not supported by reasons.

Comments deemed relevant are considered in formulating and developing alternatives, identifying applicable design criteria and/or mitigation measures, and in tracking and disclosing environmental effects. The following issues were derived from these comments and were considered in the environmental analysis.

1. Ground disturbance associated with timber harvesting and road construction may degrade the water quality of the streams in the area due to an increase in sedimentation from erosion. This may impact downstream threatened and endangered aquatic species.

2. Timber harvesting, road construction and prescribed burning may aide in the establishment and spread of non-native invasive weeds. Non-native invasive plant species are present in the project area within and along proposed treatment stands, existing wildlife openings and roads.

3. Project activities may negatively impact scenery, specifically along State Route 23 (a Virginia Scenic Byway).

4. The project may not provide enough early successional habitat for ground nesting species. Additionally, if not designed with the intention to increase edge effect and minimize the "wall of tall" along regeneration harvests, this project may not maximize the quality of habitat for various wildlife species.

5. Harvest activity on steep slopes may result in increased erosion and decreased soil quality.

## Scope of the Environmental Assessment

National Forest planning takes place at several levels: National, Regional, Forest, and Project. The Turkey Cove Ruffed Grouse Habitat Improvement Project is a project-level analysis document; its scope is confined to addressing the Purpose and Need of the project and the possible environmental consequences of the proposal and alternatives. It does not attempt to address decisions made at higher levels. It does however implement direction provided at higher levels.

The *Final Environmental Impact Statement for the Revised Land and Resource Management Plan Jefferson National Forest* (FEIS) (USDA Forest Service, 2004b) will guide this analysis. Together with the Forest Plan, these documents provide the first, or programmatic, level of the two level decision process adopted by the Forest Service. These documents satisfy many requirements of the National Forest Management Act (NFMA) while providing programmatic guidance. Where appropriate, the Turkey Cove Ruffed Grouse Habitat Improvement Project analysis tiers to the FEIS (40 CFR 1502.20).

This Environmental Assessment (EA) evaluates and documents the potential effects caused by the proposed activities and alternatives. Direct, indirect, and cumulative effects are discussed for all alternatives. Cumulative actions are limited to past and reasonably foreseeable future actions in addition to the actions of each alternative. For an action to be considered truly cumulative,

effects due to that action must overlap the impacts of this proposed action in both time and space. The administrative scope of this document can be defined as the laws and regulations that provide the framework for the analysis contained in this EA.

All of these documents are available for review on-line at https://www.fs.usda.gov/project/?project=37322 and at the Clinch Ranger District Office, 1700 Park Avenue SW, Norton VA 24273.

## Decision to be Made

Based on the stated purpose and need, the Responsible Official, who for this project will be the Clinch District Ranger, will review the analysis in the environmental assessment for this project and decide the following:

- Whether the proposed action and alternatives could result in a significant impact requiring an environmental impact statement to be prepared.
- Whether to implement the proposed action or another alternative, specific design criteria, mitigation measures, and/or project monitoring.

# Alternatives

## Alternatives Considered

This section describes the various alternatives developed by the ID Team in response to the resource needs of the project area and to specific issues and concerns identified through the public scoping process. Alternatives were designed with an interdisciplinary approach considering the:

- size and scope of the project,
- purpose and need,
- issues, and
- expected environmental impacts

The alternatives include resource protection measures and monitoring requirements. This section also provides a brief comparison of the alternatives. This information, along with the disclosure of projected environmental consequences and other included analysis found in the project file, provides the Responsible Official with the information necessary to make a reasoned choice between the alternatives. Alternatives considered but eliminated from detailed analysis area are also briefly described.

### Alternative 1 (Proposed Action)

All proposed activities occur within a contiguous block of management prescriptions 8E1 (Ruffed Grouse/Woodcock Habitat Management) and 7B (Scenic Corridors). These actions are intended to meet the Purpose and Need for this project.

#### Wildlife Habitat Creation

##### *Habitat Creation*

Progress towards the wildlife habitat objectives of this project will be completed by cutting trees and removing other biomass within 25 stands, on approximately 827 acres of hardwood and mixed hardwood/pine stands, using approved silvicultural harvesting methods, see table below. The methods will create early successional forested, and in some cases open canopy conditions, which will provide soft mast (such as pokeberry (*Phytolacca americana*), blackberries (*Rubus allegheniensis*), and blueberries (*Vaccinium spp.*)) and hiding/nesting cover for ruffed grouse and a variety of other wildlife species that benefit from the creation of early successional habitat. Soft-mast can mitigate the impacts of years when acorn production is low as the mast producing hardwoods regenerate. These young stands will also ensure a steady supply of hard mast in the most productive age classes in the future.

Existing wildlife openings, consisting of small clearings and roads mowed as linear wildlife strips, occur sporadically throughout the project area. Management activities or natural processes maintain these areas in an open condition for the long-term. Temporary roads, skidtrails, and landings used to support wood product removal provide temporary wildlife openings on a short-term and will be seeded with a Forest Service approved seed mixture. Additional beneficial

grasses, forbs, and shrubs may be planted as needed in existing and newly-created openings to contribute to wildlife and soil objectives.

To benefit ruffed grouse the project will strive to create or maintain two drumming logs per acre on average across the project area.

**Table 2. Wildlife Habitat Creation Summary Table**

| Habitat / Action | Extent |
|---|---|
| **Early Successional Habitat** | |
| Clearcut white pine (*Pinus strobus*) stands | 35 acres |
| Coppice with reserves in clumps | 84 acres |
| Shelterwood with reserves | 207 acres |
| **Early Successional Mixed With Open Canopy Habitat** | |
| Group selection [4] | 313 acres |
| **Open Canopy Habitat** | |
| Thinning | 188 acres |
| **Other Habitat Projects** | |
| Long Term Wildlife Openings - Management of existing wildlife openings including feathering (planting shrubs along hard edges) the edges / cutback field borders, overseeding a wildlife friendly mix, and controlling undesirable species | 7.5 acres |
| Short Term Wildlife Openings – Planting with wildlife approved seed mixture of skid trails, landings and temporary roads where feasible | 32 acres |
| Drumming log | 2 per acre |

[4] The group selection method encompasses both early successional habitat in some areas and open canopy in other areas that is more representative of a thinning.

## Creation and Maintenance of a Desired Mix of Tree Species, Age Classes, and Function

### *Manual Site Preparation*

Manual site preparation will be used to maintain desired stand compositional goals (e.g., ensure mast-producing species are not out-competed). Conduct manual site preparation using chainsaws and supplemental planting on approximately 326 acres of regenerated stands and approximately 103 acres of group selection openings in two group selection units as needed. Northern red oak (*Quercus rubra*), white oak (*Quercus alba*), American chestnut (*Castanea dentate*), or a mixture of these species, would be planted in these regenerated areas if there is a lack of competitive hard mast regeneration. This would help ensure an adequate composition of hard mast species in the new stand that, among other wildlife benefits, would provide future hard mast production.

### *Prescribed Fire*

Conduct prescribed burning on approximately 2,845 acres across multiple burn blocks after commercial harvests are completed. Prescribed burning is planned to meet multiple objectives:

1. Enhance foraging opportunities within forested areas.
2. Species compositional objective - to promote advanced oak regeneration in harvested areas, set back oak competitors like yellow poplar (*Liriodendron tulipifera*) and red maple, and encourage yellow pine regeneration where found.
3. Structural maintenance.

The use of prescribed burning to promote oak regeneration and yellow pine restoration will also result in herbaceous vegetation throughout the understory of the burn units; helping to meet the objective of interspersed herbaceous openings. A wide variety of fire types (headfire, backing, or flanking), different seasons (dormant versus growing season), and different return intervals may be selected to accomplish ecological, fuels reduction, and structural goals. Accomplishing these diverse and complex objectives will require multiple prescribed burn entries into each burn unit in the five to ten years post-harvest. Construction of approximately 7.3 miles of dozer line and 5.2 miles of handline would be required to augment existing man-made and natural features, like roads and streams.

### *Prescribed Fire Design and Implementation*

Every prescribed burn must have an accompanying Prescribed Fire Plan (PMS 484-1): a legal document that provides the agency administrator (official that has been delegated or assigned the authority and responsibility for the prescribed fire) the information needed to approve the plan, and the prescribed fire burn boss with the information needed to implement the prescribed fire. A prescribed fire plan must be completed, reviewed, and approved before ignition can begin.

The prescribed fire plan must be written in accordance with the PMS 484, agency policy and direction, and the National Environmental Policy Act (NEPA) decision document. Plans are written in coordination with resource and technical specialists to ensure that the plan meets resource management and operational objectives.

All prescribed burning activities on the Forest, including those proposed in this action, are conducted in accordance with the Forest Service Southern Region (R8) guidance. Smoke management planning in accordance with regional guidance has been successful in protecting health and safety during past activities. The proposed project is designed to ensure that regional guidelines are followed, and as such does not threaten to lead to a violation of any Federal, State or Local law or regulation related to air quality.

### *Non-Native and/or Invasive Plant Species Treatments*

Non-Native and/or Invasive Plant (NNIP) treatments will be used to maintain desired stand function and compositional goals (e.g., ensure mast-producing species are not out-competed). The control of non-native invasive species (NNIS) competing with native vegetation is also a desired activity along road corridors and previously disturbed areas within the Project Area. These areas can function as conduits for invasive plants creating the need for control measures. As such, we are proposing;

- Treat non-native invasive species along Forest System Roads and prescribed fire bulldozer control lines, totaling approximately 38 acres using a low volume foliar spray of glyphosate (Roundup) or triclopyr (Garlon 4) to control invasive woody species, such as autumn olive, multiflora rose, tree-of-heaven, and royal paulownia.

- Treat non-native invasive species over approximately 398 acres receiving thinning treatments. Treatment by basal bark application would use triclopyr with an adjuvant to control invasive woody species such as autumn olive, tree-of-heaven, and royal paulownia in these stands. Within this acreage figure, treatment of individual invasive plants scattered over the 398 acres would occur. For example, the 398 acres represents all the acreage in the proposed treatment units, but only individual non-native invasive species would be treated if found in these units. The same applies for the rest of the proposed treatment acres – herbicide would be applied directly to individual plants scattered over the treatment area.

- Treat approximately 429 acres with a basal bark herbicide application of triclopyr with an adjuvant or low volume foliar spray of glyphosate to control non-native species, red maple, and other undesirable species throughout the regeneration treatments. This activity will help maintain, enhance and restore the diversity and complexity of the native vegetation in the project area. Within this acreage figure, only individual invasive plants scattered over the 429 acres would be treated (either non-native invasive species or other unwanted woody vegetation that compete with important wildlife forage species or forest regeneration objectives). The same applies for the rest of the proposed treatment acres – herbicide would be applied directly to individual plants scattered over the treatment area.

**Table 3. Maintenance and Creation Summary Table**

| Treatment / Action | Extent |
|---|---|
| **Vegetative Treatments / Restoration Actions** | |
| Mechanical site prep | 429 acres |
| Southern yellow pine planting (within harvested white pine stands) | 35 acres |
| Herbicide management of non-native invasive species within treatment stands | 827 acres |
| Herbicide management of non-native invasive species along roads and dozer lines | 38 acres |
| **Prescribed Burning** | |
| Prescribed burn treatment in conjunction with mechanical treatments | 722 acres |
| Stand-alone prescribed burn treatments | 2,123 acres |
| ***Total prescribed burn treatment*** | ***2,845 acres*** |
| **Firelines** | |
| Dozerline | 7.3 miles |
| Handlines | 5.2 miles |

## Harvest Wood Products and Contribute to Markets

### *Timber Harvest*

Removal of trees and other biomass through mechanized harvest generated wildlife habitat creation is being recommended to meet the Purpose and Need. As such, the following activities will be required to meet this need;

#### Landing Creation

Construct landings (approximately 6.25 acres in total) as needed to provide adequate space for safe and efficient logging, loading, and hauling operations. Following completion of their use, these areas would be revegetated using native seed to prevent erosion and provide habitat and forage for wildlife.

#### Temporary Road Construction

Build approximately 1.3 miles of temporary roads. These roads would be revegetated, bermed and closed to vehicle traffic after all proposed activities requiring access are completed.

Woody Biomass Removal

Allow biomass removal on 827 acres of habitat creation. In consideration of sensitive soils as outlined in the soils report and in the mitigations included below, group selection cuts will be minimized on the northwestern ridge of thinning units 8, 11, and 18.

Road Maintenance

Road maintenance to facilitate project activity implementation includes brushing, ditch pulling, blading, culvert replacement, turn-widening, and gravel placement and would occur on the Forest System Roads (FSR) listed below. The following FSRs would receive some or all of the above maintenance activities.

- 9.60 miles of FSR 641
- 0.51 miles of FSR 2764
- 2.03 miles of FSR 2764A

**Table 4. Wood Product Harvesting Summary Table**

| Treatment / Action | Extent |
|---|---|
| **Volume, Roads, Skid Trails, and Landings [5]** | |
| Wood Products Contributing to Markets | 16,540 CCF |
| Temporary road | 1.3 miles |
| Skid trails | 68,900 feet<br>estimated 15 foot width = 23.7 acres |
| Bladed skid trails | 5,094 feet<br>estimated 15 foot width = 1.75 acres |
| Log landings | 25 landings<br>estimated 0.25 acre each = 6.25 acres |
| System road maintenance | 12.14 miles |

Other Habitat Improvement Activities

The watershed improvements addressed in the project are associated with the mitigation of existing travel routes that are contributing to the sedimentation of aquatic habitats and the disruption of terrestrial wildlife. In the watershed improvement, streambank stabilization and wetland/sediment basin construction is needed to improve aquatic habitat conditions. This is being proposed for the lower reaches of Collier Hollow. Current conditions include extensive erosion and streambank failures which contribute sediment directly to nearby streams. To further

[5] Estimates based on proposed treatment unit layout. Actual length and area is subject to site-specific variables.

improve the watershed, 0.8 miles of Collier Hollow Road, FSR 2780 will be decommissioned. Unauthorized routes within the project area will be blocked and restored as needed.

**Table 5. Other Habitat Summary Table**

| Treatment / Action | Extent |
|---|---|
| **Restoration Actions** | |
| Road decommissioning (FSR 2780) | Approximately 0.8 mile |
| Unauthorized routes | Unknown |

### Alternative 2 (No Action)

No vegetative treatments or other actions described in this document would be implemented under this alternative. Current management would continue. The no action alternative recognizes that ecosystems change in the absence of active management. It is essentially the "status quo" that allows current activities and policies, such as road and wildlife opening maintenance, and wildland fire management to continue and has no effect on current trends.

## Alternatives Eliminated from Detailed Study

Several alternatives were considered but not proposed for detailed study because they did not meet the project Purpose and Need, were inconsistent with Forest Plan management direction, or were not feasible due to existing conditions in the project area. Potential alternatives that received the most consideration but dropped from detailed analysis are described below.

### No Timber Harvest

This alternative was not considered because we would fall short of meeting the Purpose and Need to harvest wood products and contribute to local markets. In addition, the project's harvest units are located on lands identified as suitable for timber production per the Forest Plan.

### No Temporary Roads

An alternative was considered that proposed no temporary road development. After preliminary analysis, it was determined the project would fall short of meeting the Purpose and Need without temporary roads. The temporary roads are needed to access the proposed regeneration harvest units. The large majority of the thinning units are accessible without new temporary roads, however, this would have the effect of limiting the creation of early successional habitat. Therefore, this alternative was removed from further analysis.

### No Prescribed Fire

The project Purpose and Need is focused on habitat enhancement through oak regeneration and restoration of southern yellow pine communities. The ecosystems we know today developed within the influence of both climatic and human forces. The result is a forest with diversity and resilience that is well adapted to fire occurrence. Oak and southern yellow pine communities

have been major components of these forests for thousands of years. These communities promote and require fire. Therefore, an alternative with no prescribed burning was removed from further analysis since fire is an effective tool for accomplishing the Purpose and Need of this project.

### Maximize Available Early Successional Habitat

Public interest in this project requested this project strive to create more early successional habitat than was proposed. The project was designed both to implement Forest Plan direction as well as stay within the confines of what the Forest Plan prescribes. The management prescriptions included in the project area define allowable acres for early successional habitat development. This project was designed to meet those criteria, and not exceed it. Therefore, this alternative was removed from additional consideration.

### Creation of Early Successional Habitat in Stands Harvested Within the Past 20 Years

Public interest in this project requested we assess the option of focusing harvesting on stands within the project area that have been harvested within the past 20 years. These stands are still relatively young, making harvest of these locations economically prohibitive since they have low timber value. When compared to typical rotation lengths of stands within the project area, reducing the rotation age to 20 years would increase sediment delivered to the nearby streams, increase risk for non-natives and do very little to contribute to species goals and overall function of the forest. Furthermore, Forest Plan standard FW-113 prohibits regeneration harvest prior to culmination of mean annual increment [6] (CMAI).

### Increased Thinning

Many stands within the project area are fully to over-stocked and would benefit from a thinning treatment. They are well past the culmination of mean annual increment and past the biological rotation age. Although thinning at an older age is not typical, Hilt found that diameter growth of the largest 40 trees per acre shows a distinct response to thinning, regardless of age or site index in upland oaks (Hilt 1979). This would do little to benefit the declining scarlet oak found throughout the project area that are already well past their average life expectancy of 80 years. Additionally, it would do nothing to increase the early successional habitat in the project area, nor would it be economically feasible as harvest yields from thinning would be low.

## Design Criteria and Resource Protection Measures

The proposed action will follow the Forest-wide common standards stated in the Forest Plan. Most applicable are the standards found on pp. 2-7 through 2-62 for Forest-wide Standards, pp. 3-75 through 3-77 related to Standards for management prescription 6A (Old-Growth Forest Communities Not Associated With Disturbance), pp. 3-89 through 3-91 related to Standards for management prescription 7B (Scenic Corridors), pp. 3-127 through 3-128 related to Standards for management prescription 8E1 (Ruffed Grouse/Woodcock Habitat Emphasis), pp. 3-153

[6] The culmination of mean annual increment is the age at which average rate of annual tree growth stops increasing and begins to decline.

through 3-155 related to Standards for management prescription 9A1 (Source Water Protection Watersheds), and pp. 3-181 through 3-187 related to Standards for management prescription 11 (Riparian Corridors). Potential effects can be reduced or eliminated by implementing design criteria specified in the Forest Plan standards, project-specific resource protection measures, and through use of Virginia Department of Forestry Best Management Practices for Water Quality (Virginia Department of Forestry, 2011).

### Project-Specific Resource Protection Measures

The following resource protection measures were specifically developed for this project and are in addition to standards outlined in the Forest Plan.

- To minimize soils impacts and sedimentation effects to water quality:
    - Where there are small inclusions of steeper slopes (over 35 percent) in the harvest units, require winching logs to a skid trail/road to mitigate the slope and avoid excessive skid road building. Winches would be required in the timber harvest contract.
    - Skid trails/roads would be minimized on slopes in excess of 35 percent unless determined necessary to reduce the total amount of skid trails and reduce the total soil disturbance.
    - Areas of steep inclusions on Unit 9 (in excess of 50 percent slope) would require winching.
    - Locations of soil disturbance (skid trails / roads, temporary roads, log landings) should either have slash put down or be limed, fertilized, seeded and mulched promote erosion control, vegetation cover, and protect aquatic resources. A Forest Service seed mix should be used.
    - Heavily compacted areas should be ripped and seeded to help minimize the effects of compaction and to water infiltration and to promote revegetation.
    - Temporary roads, skid trails / roads should be water barred (have broad based dips installed) to permit the proper drainage of water.
    - Cut and fill banks around landings should be sloped to remove overhangs to minimize erosion.
    - Slash or other materials should be placed in skid trails to discourage illegal all-terrain vehicle (ATV) use.
    - Equipment should not be operated when ground conditions are such that excessive damage will result.
    - Erosion control work should be kept current immediately preceding expected seasonal periods of precipitation or runoff.
    - On soils sensitive to acid deposition along the ridgetop on Units 8, 11, and 18 group openings should be minimized to maximize the amount of residual coarse and fine woody debris and logging slash to contribute to soil productivity.

- To maintain wildlife habitat:
    - Wildlife trees (large hollow trees) would be identified and retained as leave trees as necessary.
- To maintain scenic integrity:
    - Retention trees that would be marked in thinning units should have paint on the tree on the side facing away from the road to meet Scenic Integrity Objectives (SIOs) described in the Forest Plan.
    - For regeneration harvest units in High and Moderate SIO areas, a band of trees 60-100' in width would be retained, transitioning the leave-tree density from higher density near travelways to the desired density within the unit.
    - Any openings that extend to designated travelways would be random in width of the opening and in spacing between any openings.
    - To the extent feasible, these openings should appear natural with obvious human-made features, such as temporary roads, skid trails, landings, and slash, located in areas that are less likely to be seen from Concern Level 1 routes and sites.
    - Geometric shapes should be avoided in regeneration harvest units within High and Moderate SIO areas.

## Monitoring

Monitoring of the project actions will occur to ensure that various aspects of the project adhere to the standards of the Forest Plan, the applicable State Best Management Practices, and conform to project-specific resource protection measures set forth in this document. Monitoring will also occur to verify that accuracy of the predicted effects this assessment discloses. Specific monitoring responsibilities and activities include:

The Timber Management Assistant (TMA)/Silviculturist and District Biologist will review the project prior to implementation to ensure that the locations of any access routes, sale boundaries, and the silvicultural prescriptions are carried out as described by this assessment.

The Timber Sale Contract team, primarily the Timber Sale Administrator, will ensure actual operation of the timber sale follows measures described in this assessment.

The District TMA/Silviculturist/Forester/Technicians will survey the stands one year and three years following sale closure to determine if harvest areas have regenerated adequately. In addition to adequate regeneration, the species composition of the regeneration will be monitored. An important part of certifying regeneration will be to monitor for the presence of any non-native invasive species in these areas.

The District TMA/Silviculturist will monitor all temporary road locations, landings and bladed skid roads for at least three years following sale closure to ensure sites are stable and adequately re-vegetated and will monitor control needs of non-native invasive species.

Prescribed burn units will be monitored using several protocols, as resources and funding allow. These would include Canopy Gap Analysis (CGA), Forest Structure and Composition (FSC) Monitoring Protocol, and photo monitoring. This is described in further detail in the *GW-Jeff Prescribed Fire Design, Implementation, and Monitoring* document (USDA Forest Service, 2018) contained in the project record.

## Forest Plan Consistency

Projects must follow Forest Plan direction, including the Forest-Wide Management Requirements and individual management prescription direction and their associated standards. This EA displays site specific consequences of implementing each alternative. Upon review, all alternatives are consistent with the Forest Plan direction.

# Environmental Effects

The chapter describes the existing condition of the project area and discloses the anticipated direct, indirect, and cumulative effects of the proposed project. The Project Record provides a central location where project information used in analysis is filed and will remain accessible to the public until a final decision for the project is signed. The Project Record is available for public inspection at the Clinch Ranger District Office in Norton, VA.

## Past, Present and Reasonably Foreseeable Future Actions

As required under NEPA and the regulations implementing NEPA, interrelated projects are considered in determining potential cumulative impacts from past, present, and reasonably foreseeable future actions combined with the proposed action. Cumulative effects result from the incremental effect of the action when added to current or anticipated effects of other related actions in the analysis area. Cumulative effect analysis areas were defined by each resource to better understand anticipated effects (40 CFR 1508.7).

## Resources or Uses Not Present, Outside of Scope of Analysis, or Not Affected

Resources or uses that were not present or directly or indirectly impacted by the alternatives and not further analyzed or whose analysis was out of the scope appropriate for this project include:

- Heritage and Cultural Resources: A Phase 1 reconnaissance archeological survey was completed in the project area. The survey covered all proposed cutting units and activities within these areas (bladed skid roads, landings), temporary road construction, and fire line construction. Any identified resources will be avoided. We received concurrence from the appropriate Cherokee Tribal Historic Preservation Offices in October of 2018. The State Historic Preservation Officer concurred with this finding on November 13, 2018.
- Old Growth: Old growth surveys were completed and no old growth locations were identified within harvest units.
- Lands and Special Uses
- Inventoried Roadless Areas
- Wilderness
- Rare Communities
- Climate Change

Additional details and analysis describing the resources and uses mentioned above are located in the Project Record.

## Biological Environment

### Major Forest Communities

This section summarizes the potential impacts of the proposed action and no action on the major forest communities within the project analysis area. The full analysis can be found in the *Turkey Cove Forest Communities Report* (USDA Forest Service, 2019a).

#### Existing Conditions

There are approximately 4,730 acres and five separate Forest Plan Management Prescriptions within the Turkey Cove Ruffed Grouse Habitat Improvement project area. As indicated in Table 6, a small pocket of 6A Old Growth Communities Not Associated With Disturbance extends for approximately 35 acres along the southern boundary of the project area; this is less than one percent of the total project acreage. The southeastern edge of the project is 9A1 Source Water Protection Watershed and makes up 105 acres (about two percent) of the project area. The majority of the project area is located within 8E1 Ruffed Grouse and Woodcock Habitat and 7B Scenic Corridors. They are 3,556 acres (about 75 percent) and 1,034 acres (about 22 percent) of the project area respectively. The other management prescription in the project area is 11 Riparian Corridors– Streams, Lakes, Wetlands, and Floodplains, which is embedded within the other management prescriptions and found throughout the project area.

**Table 6. Management Prescriptions within the Project Area.**

| Prescription | Acreage | Percent of Project Area |
|---|---|---|
| 6A Old Growth Communities Not Associated With Disturbance | 35 acres | < 1% |
| 7B Scenic Corridors and Viewsheds | 1,034 acres | 22% |
| 8E1 Ruffed Grouse and Woodcock Habitat | 3,556 acres | 75% |
| 9A1 Source Water Protection Watershed | 105 acres | 2% |
| 11 Riparian Corridors– Streams, Lakes, Wetlands, and Floodplains | Embedded | - |

The majority of proposed treatments would take place only within management prescriptions 8E1 and 7B. However, some early-successional forest habitat creation may occur in the extended area (outside of the core) in the riparian corridors to meet the Purpose and Need of the project.

**Figure 3. Yellow pine snag with fire scar within project area.**

As described above, past events have played a substantial role in creating the vegetative condition existing today. Since the early 1900s aggressive fire suppression has occurred nationally. This fire suppression effort has also lead to the development of very dense under- and mid-stories and an accumulation of down woody debris on the forest floor in many stands within the project area. In these stands, these conditions result in an increased risk of uncharacteristic wildfire than would otherwise exist if aggressive fire suppression had not occurred and the natural fire regime was allowed to continue. The project area does have signs of past fire disturbance as illustrated in Figure 3. Trees with fire scars, such as this one, confirm past fire events. The direction of the scar faces indicate the direction the wind was blowing towards when the fire was burning (Gutsell and Johnson, 1996). Since 2003, several wildfires and two prescribed fires have occurred in the project area. All of the wildfires in the project area were human caused except one, which was caused by lightning. The prescribed fires totaled 985 acres in size and occurred in the central part of the project area in 2003. See fire history in project record for details on year and location of the wildfires.

Across the project area there are roughly 29 non-forested acres embedded within the management prescriptions outlined above. These are primarily roads and maintained wildlife openings. In the forested area, there have been no timber harvests in the project area in the past ten years. The stands that were harvested in the past are now fully regenerated and can be described as being in either the sapling or immature pole timber stage of development. These stands are no longer providing early successional habitat, which is an important wildlife habitat objective for this management area.

Much of the Turkey Cove Ruffed Grouse Habitat Improvement project area is fully to overstocked, (see stocking chart in Gingrich 1967) and of coppice origin. Oaks dominate the landscape, varying between chestnut oak (*Quercus prinus*) / scarlet oak (*Quercus coccinea*) stands on the drier ridges, to northern red oak (*Quercus rubra*) and white oak in areas of deeper soils and more moisture. Yellow pines are fairly prevalent on the south aspects of dry ridges within the project area, especially in compartment/units 2076/06, 2077/11, 2077/17, 2078/14,

and 2079/15. Site indexes range from fair to poor, with soil depth and moisture being the limiting factor. On the drier sites, oak-yellow pine stands are found in small patches, although in declining health. These relatively low site index stands often have a thicket of mountain laurel (*Kalmia latifolia*) growing below them. *Vaccinium* species cover the ground on most of the dry sites throughout the project area. This is generally a mix of high bush blueberry, low bush blueberry, and huckleberry.

The mid-story species are dominated by black gum (*Nyssa sylvatica*), red maple, and sourwood (*Oxydendrum arboretum*). In some areas, mountain laurel and rhododendron (*Rhododendron maximum*) dominate the understory. Non-native invasive species such as autumn olive, multiflora rose, tree-of-heaven, royal paulownia, and Japanese honeysuckle (*Lonicera japonica*) are commonly found throughout the project area.

The project area is dominated by late successional habitat; approximately 57 percent of the acres are late successional. The existing condition of the project area does not meet the overall project objective to maintain ten percent of the project area in early successional habitat (less than ten years old) dispersed throughout.

**Table 7. Existing Successional Habitats within the Project Area**

| Successional Habitat | Acres | Percent |
|---|---|---|
| Early (0-10 yrs.) | 49 | < 1% |
| Sapling/Pole (11-40 yrs.) | 597 | 13% |
| Mid (41-80 yrs.) | 1,402 | 30% |
| Late Successional<br>(80-129 or 139 yrs. depending on forest community type) | 2,683 | 57% |
| Old Growth<br>(130 or 140+ yrs. depending on forest community type) | 0 | 0% |
| **Total** | 4,730 | 100% [7] |

Stand-level factors such as tree age, species composition, and stocking rate are associated with Oak Decline, a slow-acting disease complex. Several biotic and abiotic factors contribute to the decline, meaning no single cause can be identified. However, overstocked stands of mature trees, such as those found within the project area, exacerbate moisture stress during drought periods and increase risk of mortality.

[7] Percentages add up to 101% due to rounding

## Direct, Indirect, and Cumulative Effects

### *Alternative 1*

#### Post-treatment Condition

Forest vegetation would be directly affected by early successional creating harvest as the stand development changes from Oliver and Larson's (1996) stem exclusion to stand initiation within harvested areas in the project area. All openings created to make early successional habitat would meet the Forest Plan Standard FW-114 of 40 acres for size limitations due to resource buffers and areas not being proposed for harvest. These treatments would increase sunlight to the forest floor, favoring the establishment of new trees, shrubs, forbs, and other vegetation, and trending the area towards the early successional habitat desired conditions.

#### Harvest Method

Regenerating tree species composition is expected to be similar to the existing vegetation due to the viable nearby seed sources and to the potential for coppice regeneration within the harvested stands. Each stand being harvested to create early successional habitat is expected to establish enough viable regeneration within five years after harvest to meet restocking requirements (Forest Plan, pp. 2-33 to 2-34). Natural regeneration is expected to grow at current site potential as soil productivity is not expected to decline from existing condition. Trees are expected to be vigorous and mostly insect and disease free.

Regeneration methods such as clearcut, coppice and shelterwood with reserves are the two aged harvesting systems being recommended. Commercial thinning and uneven-aged management system, such as group selection, are also potential treatment methods. It was determined that all of these management systems would meet the needs for the proposal due to their ability to contribute to the goals outlined in the Purpose and Need. However, thinning and uneven-aged management systems are more costly, remove less volume, and have higher potential to damage the residual stand during yarding.

Group selection is an uneven-aged regeneration method that requires the cutting of stems in geographically contiguous groups. The diameter of these groups is usually 1.5 to 2 times the average height of the surrounding mature trees; generally less than ½ acre in size. Several cutting cycles are usually required to create an uneven-age structure. These frequent entries for harvesting require elaborate networks of carefully planned skid trails and roads. Decreased cutting cycles increase the level of site disturbance over the span of the treatment within the stand.

Group selection is more favorable to intolerant species that do not regenerate in the small openings created by single-tree selection (Clatterbuck et al., 2010). In a study done in central Appalachian mixed hardwood stands, shade intolerant species increase in population with larger openings (Dale et al., 1985) while, generally speaking, logging costs decrease (LeDoux 1999). After 30 years of regeneration, Ledoux (1999) found that smaller group opening sizes had fewer trees per acre, smaller trees and more shade-tolerant species. It is also important to note. In opening sizes less than ½ acre (a typical group selection opening), Dale et al. (1985) found that shade-tolerant species dominated the openings. In this project, openings ½ acre to 2 acres are

being recommended to increase the potential for competitiveness of intermediate shade tolerant oak species.

Reserve trees in the two-aged regeneration harvest have a higher susceptibility to wind-throw. Wind throw and breakage of residual "reserve trees" may occur from exposure to a more open environment. Trunk wounding and root damage from equipment can also occur in reserve trees as well as harvest edges. However, these should be minimized with careful felling and by grouping reserve trees in some instances. There would be an overall increase in the abundance and diversity of shrubs, herbs, and forbs for about ten to fifteen years before trees occupy most of the growing space.

Prescribed Fire

Prescribed burning is the deliberate application of fire to forest fuels under specified conditions such that well-defined management goals are attained (Wade and Lunsford, 1989). Prescribed burning significantly reduces mid-story /understory densities, a condition considered prerequisite for satisfactory recruitment of advanced regeneration (Barnes and Van Lear, 1998). Prescribed fire is an effective way to manage large areas for tree regeneration, silvicultural improvements, range and wildlife habitat management, control of weeds, insects and disease and biodiversity maintenance (Kilgore and Curtis 1987; Wade and Lunsford, 1989). However, it has the potential to damage and kill desirable residual trees. Char of residual trees may result in reduced grade in residual timber reducing the economic value of the retained stand. Prescribed fire can also result in temporary blackening along the ground that may be noticeable to the public using roads and trails in the vicinity.

Harvest

In the 2006 study, *Virginia's Forest Our Common Wealth*, Virginia Department of Forestry estimated that for every dollar of stumpage received by forest landowners, $41.82 is generated by value added activities. In a more recent 2013 report (Rephann, 2013) it was found that every job created in forestry-related industries in the Virginia economy produces 1.6 other jobs in Virginia and that every dollar generated in the agriculture and forestry-related industries results in another $1.63 value-added in the Virginia economy. The forestry sector alone in Virginia has a total impact of over $17 billion in total industry output, approximately 103,800 jobs, and $8.8 billion in Value-added. In an attempt to quantify the social economic benefits of ecological services provided by the forestland in Virginia, a value transfer approach was used to determine that the Commonwealth receives $6.385 billion in estimated air and water environmental services value from forestry each year (Rephann, 2013).

To meet the need of the project, the trees identified for removal would be sold to fulfill the need for providing marketable wood products. This project has the potential to contribute 1.65 million cubic feet (MMCF) [9 million board feet (MMBF)] over the next five to ten years. Given that recent sales of size and composition have sold for $32/CCF, the potential for this alternative is to provide $539,800 of value to local markets. This does not include any value-added activities.

Indirect Effects

Untreated areas around streams, reserve trees/clumps, and areas of inaccessibility would continue to develop while benefitting from increased growing space and increases in sunlight from the surrounding harvested areas. However, indirect effects are anticipated from harvesting overstory vegetation because of the potential to increase the chance of wind-throw in adjacent unharvested stands and reserve clumps. Currently, the stands have minor amounts of wind-throw (blowdown) indicating that winds influence stand development. Also, the stands currently have pockets of NNIS in competition with forest cover. Ground disturbance from harvest activities and prescribed burns have the potential to exacerbate NNIS within forest.

#### *Alternative 2*

Under the no action alternative, stand structure and composition would not be altered. The stands within the analysis area would continue to follow current trends, including non-compliance with the Forest Plan, overstocked condition leading to reduced growth rates, and continuing susceptibility to Oak Decline.

Taking no action would not meet the Purpose and Need of this project; there would be no creation or enhancement of wildlife habitat, no additional wood products for the local market, and no new progress towards the desired mix of tree species and age classes described in the Forest Plan desired conditions.

#### *Cumulative Effects*

The impacts of all past actions are represented by the existing situation as far as vegetation is concerned. All harvested areas are expected to regenerate and develop as described in the direct and indirect effects section above. Reasonably foreseeable actions in the harvest units; site prep, prescribed fire and wildlife openings are managed to control NNIS. The combined effect would be a reduction in seed source and number of stems of woody competition to desirable regeneration. Native species would be provided a much better chance to establish themselves and grow successfully to maturity. The ecological integrity and resilience of the harvested areas would be enhanced by controlling NNIS populations and cultivating native species. The cumulative effects would result in a forested stand; therefore there would not be cumulative effects from NNIS.

### Threatened, Endangered, and Sensitive Species

This section summarizes the potential impacts of the proposed action and no action on the threatened, endangered, and sensitive (TES) species within the project analysis area. The full analysis can be found in the Biological Evaluation/Biological Assessment (BE/BA) for this project and in the document *Turkey Cove TESLR Report* (USDA Forest Service, 2019b).

Forest Service regulations require that the project be reviewed to ensure that it does not contribute to loss of viability of any native or desired non-native species, or contribute to trends toward federal listing. The project must also comply with the requirements of the Endangered Species Act (ESA) and provide a process and standard to ensure that threatened, endangered,

proposed, and sensitive species receive full consideration in the decision-making process using the best available science.

The following four TES or Regionally Sensitive species are known or suspected to occur in or near the project area or are potentially impacted by the proposed action. Other than these species, no other TES or Regionally Sensitive species or designated/proposed critical habitat were identified during field surveys or considered to exist within the project area or the aquatic cumulative effects boundary.

**Table 8. TES and Regionally Sensitive Species within the Project Area**

| **Common Name** | **Scientific Name** | Category | **Status** |
|---|---|---|---|
| Indiana bat | *Myotis sodalis* | Mammal | Endangered |
| Northern long-eared bat | *Myotis septentrionalis* | Mammal | Threatened |
| Tricolored bat | *Perimyotis subflavus* | Mammal | Sensitive |
| Sweet pinesap | *Monotropsis odorata* | Plant | Sensitive |

Through the appropriate application of Forest Plan guidance and project-specific design criteria, it can be reasonably concluded that there will be no significant effects to threatened, endangered, and sensitive species from the proposed action. Taking no action to implement treatments would maintain the status quo of habitat conditions and trends.

### Locally Rare Species

This section summarizes the potential impacts of the proposed action and no action on the locally rare species within the project analysis area. The full analysis can be found in the document *Turkey Cove TESLR Report* (USDA Forest Service, 2019b).

Locally rare species are those species determined at the Forest level due to concerns about losing representation of that species on the Forest, even though they are secure range-wide. Locally rare species are analyzed if they occur within a county or watershed that overlaps with the project area and if appropriate habitat is present within the project area (excluding protected habitat types such as a wetland or riparian areas).

#### Aquatic Locally Rare Species

Five aquatic locally rare species range downstream from the project area in the Clinch and Powell Rivers, outside the cumulative effects boundary for this project. There will be no effect to these aquatic species from the proposed action. Taking no action to implement treatments would maintain the status quo of habitat conditions and trends.

**Table 9. Aquatic Locally Rare Species**

| Common Name | Latin Name | Category |
|---|---|---|
| Steelcolor shiner | *Cyprinella whipplei* | Fish |
| Mirror shiner | *Notropis spectrunculus* | Fish |
| Fragile papershell | *Leptodea fragilis* | Freshwater mussel |
| Black sandshell | *Ligumia recta* | Freshwater mussel |
| Deertoe | *Truncilla truncata* | Freshwater mussel |

### Terrestrial Locally Rare Species

Eight terrestrial locally rare species may be present within the project area. This project will be completed according to Forest Plan direction and standards and though some habitat will be disturbed, many acres will remain in an undisturbed state. Therefore, the proposed action should not affect continued representation of these species on the George Washington and Jefferson National Forests (GWJNFs). Taking no action to implement treatments would maintain the status quo of habitat conditions and trends.

**Table 10. Terrestrial Locally Rare Species**

| Common Name | Latin Name | Category |
|---|---|---|
| Little brown bat | *Myotis lucifugus* | Mammal |
| Cooper's hawk | *Accipiter cooperi* | Bird |
| Sharp-shinned hawk | *Accipiter striatus* | Bird |
| Golden eagle | *Aquila chrysaetos* | Bird |
| Cerulean warbler | *Dendroica cerulea* | Bird |
| Swainson's warbler | *Limnothlypis swainsonii* | Bird |
| Creeping aster | *Eurybia surculosa* | Plant |
| Highland dog-hobble | *Leucothoe fontanesiana* | Plant |

## Management Indicator Species

This section summarizes the potential impacts of the proposed action and no action on the Management Indicator Species (MIS) within the project analysis area. The full analysis can be found in the *Turkey Cove MIS Report* (USDA Forest Service, 2019c).

As described in the Forest Plan, MIS have been chosen to represent threatened and endangered species, species with special habitat needs, species commonly hunted, fished, or trapped (demand species), non-game species of special interest, and species that indicate effects to major biological communities. Specific habitat objectives related to these species are located in several

places throughout the Forest Plan. The monitoring program outlined in Chapter 5 of the Forest Plan contains specific objectives for these management indicator species. During the course of identifying any issues pertaining to a project, consideration is given to the MIS.

**Table 11. MIS selected for the Project Area**

| Name – Common (*Latin*) | Justification |
|---|---|
| Pileated woodpecker (*Dryocopus pileatus*) | Detected in survey |
| Ovenbird (*Seiurus aurocapillus*) | Detected in survey |
| Acadian flycatcher (*Empidonax virescens*) | Detected in survey, found across District, habitat present, habitat could be undisturbed or enhanced with management activities |
| Pine warbler (*Dendroica pinus*) | Not detected in survey, habitat could be created/enhanced with management activities |
| Hooded warbler (*Wilsonia citrina*) | Detected in survey |
| Scarlet tanager (*Piranga olivacea*) | Detected in survey |
| Eastern towhee (*Pipilo erythrophthalmus*) | Detected in survey |
| Eastern wild turkey (*Meleagris gallopavo*) | Detected in survey, habitat could be created/enhanced with management activities |
| Black bear (*Ursus americanus*) | Detected in survey |
| White-tailed deer (*Odocoileus virginianus*) | Detected in survey |

**Table 12. Population Trends Among MIS Bird Species in Appalachian Mountain Region in VA**

| Species | Number of Observations | Trend 1966-2015 | Trend 2005-2015 | Relative Abundance |
|---|---|---|---|---|
| Pileated woodpecker | 56 | +2.07 | +2.53 | +1.84 |
| Ovenbird [8] | 55 | +0.73 | +1.52 | +7.28 |

[8] Appalachian Mountain regional data used instead of state data because of questions about the validity of the state-level dataset

| Species | Number of Observations | Trend 1966-2015 | Trend 2005-2015 | Relative Abundance |
|---|---|---|---|---|
| Acadian flycatcher | 57 | -0.79 | -1.82 | -7.06 |
| Pine warbler | 51 | 0.82 | -0.04 | 4.04 |
| Hooded warbler | 51 | 0.78 | 0.70 | 2.09 |
| Scarlet tanager | 55 | 0.70 | 1.58 | 5.50 |
| Eastern towhee | 57 | -1.37 | -1.96 | -15.88 |

Note for Table 12, state bird population data are summarized from the on-line Breeding Bird Survey Data Application (Sauer et. al., 2017).

For detailed discussion of the specific habitats or communities represented by the MIS, please refer to the Forest Plan, Chapter 2 (Forest-wide Direction), pp. 2-10 through 2-18 and the Final Environmental Impact Statement (FEIS) for the Forest Plan, Chapter 3, pp. 3-63 through 3-67, "Major Forest Communities," "Pine and Pine-Oak".

### Special Habitat Indicators

Special habitat attributes such as hard and soft mast, den trees, snags, downed wood, and brushy areas are necessary elements for certain species. A variety of Forest Plan goals, objectives, and standards provide for the protection, restoration, and maintenance of these elements. Taking no action to implement treatments would maintain the status quo of habitat conditions and trends.

**Table 13. Special Habitat Indicator Species Proposed Action Significance**

| Special Habitat | Indicator Species | Significant Effect? |
|---|---|---|
| Snags and Downed Wood Habitat | Pileated woodpecker | No |
| Interior Forest Habitat | Ovenbird | No |
| Riparian Habitat | Acadian flycatcher | No |

### Biological Community Indicators

Some species can indicate effects to major biological communities and whether management activities are successful in maintaining or restoring composition, structure and function of forest communities. Taking no action to implement treatments would maintain the status quo of the current conditions and trends within the biological communities.

**Table 14. Biological Community Indicator Species Proposed Action Significance**

| Biological Community | Indicator Species | Significant Effect? |
|---|---|---|
| Mid- and Late Successional Pine and Pine-Oak Forest | Pine Warbler | No |
| Dense Under- and Mid-Story in Mesic Mature Forest | Hooded Warbler | No |
| Drier Mid- to Late-Successional Forest | Scarlet Tanager | No |
| Early-Successional Forest | Eastern Towhee | No |

### Demand Species

National Forest lands provide large tracts of public ownership with opportunities for hunting, fishing, and wildlife viewing. The following species are identified in the Forest Plan as Management Indicator Species where effects of National Forest management are important to meeting public demand. Monitoring of hunting/harvests will indicate whether management of the habitat is being accomplished at appropriate levels. Taking no action to implement treatments would maintain the status quo of habitat conditions and trends affecting demand species.

**Table 15. Demand Species Proposed Action Significance**

| Demand Species | Significant Effect? |
|---|---|
| Eastern wild turkey | No |
| Black bear | No |
| White-tailed deer | No |

## Migratory Species

The protection of migratory birds is regulated by the Migratory Bird Treaty Act (MBTA), Executive Order 13186, and the Bald and Golden Eagle Protection Act (BGEPA). To comply, the Forest Service entered into a Memorandum of Understanding (MOU) with the U.S. Fish and Wildlife Service. The parties agreed that through the NEPA process, the Forest Service will evaluate the effects of agency actions on migratory birds, focusing first on species of management concern along with their priority habitats and key risk factors.

The direct, indirect and cumulative effects of proposed actions on migratory bird species of concern, including bald and golden eagles, are analyzed and disclosed for any avian locally rare species identified to be present, or likely to be present based on suitable habitat, within the projects area. In addition, avian MIS are designed to represent the suite of migratory bird species

that require similar habitat needs on the George Washington and Jefferson National Forests (USDA Forest Service, 2004c, USDA Forest Service, 2014). As noted in the appropriate sections above, it can be reasonably concluded that there will be no significant effects to avian locally rare species or avian MIS from the proposed action. Taking no action to implement treatments would maintain the status quo of habitat conditions and trends.

## Physical Environment

### Water Resources

This section summarizes the potential impacts of the proposed action and no action on hydrology and water resources within the project analysis area. The full analysis can be found in the *Turkey Cove Hydrology Report* (USDA Forest Service, 2019d).

The Turkey Cove Vegetation Management project is within two sub-watersheds: the Upper North Fork of the Clinch River and Butcher Fork – South Fork of the Powell River. The project area is drained by the Butcher Fork of the South Fork of the Powell watershed (3,068 acres), the North Fork of the Clinch River watershed (4,927 acres), and Lovelady Creek watershed (2,538 acres). These comprise the analysis area for effects determination. The majority of these watersheds are in forested land cover; however, farms and single family homes exist on some private parcels.

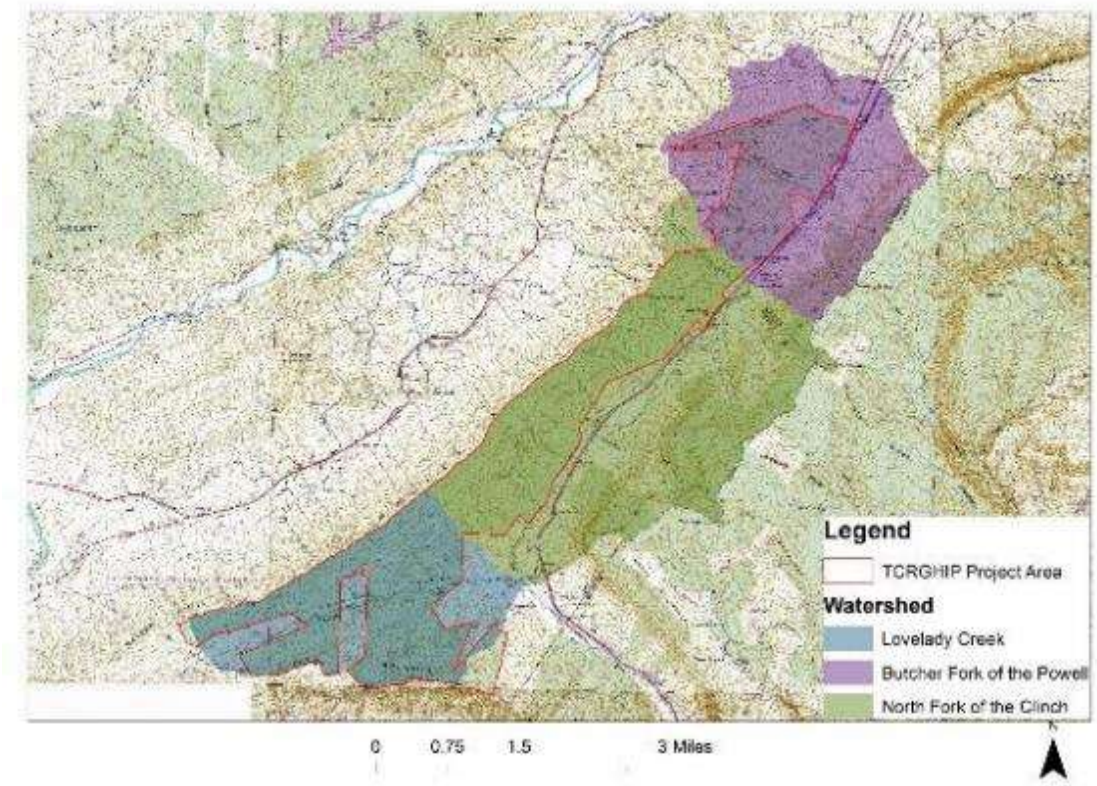


**Figure 4. Watersheds affected by project activities.**

## Direct, Indirect and Cumulative Effects

### *Effects from Herbicide Application*

For a complete discussion of the effects of the application of herbicides on soil and water resources, consult *Environmental Assessment of Forest-Wide Non-Native Invasive Plant Control George Washington and Jefferson National Forests* (hereinafter referred to as the Herbicide EA) (USDA Forest Service, 2010).

All treatments undertaken would conform to policy, laws and regulations, and Forest Plan standards and guidelines. Mitigation measures listed in Chapter 2.3 of the Herbicide EA (pp. 20-28) would additionally minimize soil and water contamination by herbicides.

Direct effects to soil and water resources may include some limited drift from fine mists during application. Once in the soils, some herbicides can migrate via gravity, leaching, and surface runoff to other soils, groundwater, or surface water. To determine the level of risk for accumulation of herbicide residues on soils and possible contamination of ground and surface water, factors such as persistence (measured in half-life), mobility, and mechanisms for degradation have been reviewed (Appendix C, Herbicide EA). However, most of the herbicide treatments would be applied directly to targeted species and relatively little herbicide would make contact with the soil.

### *Effects to Streams from Sedimentation*

Sediment can cause turbidity, and is therefore subject to standards and regulations set forth by the Commonwealth of Virginia. State regulations require the voluntary application of Best Management Practices (BMPs) to control sedimentation during timber management activities; these can be found in *Virginia's Forestry Best Management Practices for Water Quality Technical Guide* (Virginia Department of Forestry, 2011). The Virginia Department of Forestry water quality monitoring has shown that, when forestry BMPs are properly implemented, timber harvests can be accomplished without a large or persistent increase in sediment or stream water temperatures, or a shift in macroinvertebrate species composition.

Some sediment occurs naturally in all stream systems and is part of the natural geologic processes. Natural watershed disturbance regimes of fire, flood, insect, and disease result in a range of natural variability of sediment to which the stream channel has adjusted. However, human caused soil disturbing activity such as road construction activities, log landings, skid roads, and skid trails can produce volumes and rates of sediment delivery to streams that are in excess of the stream's ability to accommodate it. Excess sediment in streams can coat the stream bottom, fill pools, and reduce the carrying capacity of the stream for fish and stream insects. Fine sediment can fill the voids between gravel particles in the streambed, reducing the movement of aquatic insects, water and oxygen. The effects of sediment delivered to a stream channel diminish as watershed size increases. Most vulnerable are small, sensitive headwaters catchments where concentrated timber harvest activity can have profound results.

The effect that naturally occurring forest fires or prescribed burns can have on increased sediment production within a watershed depends on burn intensity. Low intensity burns do not

scorch the soil organic layers nor do they burn the roots of existing vegetation, which starts to re-grow during the next growing season. No bare mineral soil is exposed as the result of the burn. Research on wildfire and prescribed burning indicates that low intensity or "cool" burns result in only minor increases in erosion and sedimentation (Beschta, 1990).

Hand line construction for this project will be accomplished using leaf blowers and rakes. Mineral soil will be relatively undisturbed. Accordingly, this activity will have little impact on erosion and sedimentation. Dozer line will be single-blade wide, and as the analysis shows, these kinds of narrow, transient sediment impacts are not significant.

Rates of soil erosion and sedimentation are greatest at the time of soil disturbing activity and decrease as the soil stabilizes and vegetation begins to grow. Second year sediment rates are estimated to be only 35 percent of first year rates. After four years, sediment rates have usually returned to pre-disturbance levels. All these projected levels are based on the cessation of road traffic. Illegal or continued administrative use will extend the amount of time it takes to return to near-background.

A sediment model was used to estimate the tons of sediment produced by each road, landing, or excavated skid trail, and delivered to respective stream channels. Sediment modeling is based on a number of assumptions that may not be accurately reflected on the ground. The results provide very rough approximations of the changes in sediment delivery that might be expected as a result of proposed activities. Nevertheless, they allow a comparison of the impacts of various alternatives and provide a measure of relative risk to the aquatic ecosystem. The model assumes that Forest Plan standards and guidelines as well as Virginia Best Management Practices for Forestry will be implemented. It assumes a "normal" runoff and sediment year.

Lovelady Creek

The predicted sediment increases from the proposed action are 3.1 percent over background for this watershed. No changes in stream bed composition should occur. The increase in sediment is small when compared to the background values and well within the interannual variability of the system. Aquatic habitat quality or complexity should not be reduced from sediment related to the project. There should be no measurable or observable direct, indirect, or cumulative effects to Lovelady Creek or its tributaries in the project area, or to any reaches downstream. Reducing or eliminating impacts from the illegal trails should be a priority to lessen the impacts these areas are having on the stream.

North Fork of the Clinch River

The predicted sediment increases from the proposed action are 3.1 percent over background for this watershed. No changes in stream bed composition should occur. The increase in sediment is small when compared to the background values and well within the interannual variability of the system. Aquatic habitat quality or complexity should not be reduced from sediment related to the project. There should be no measurable or observable direct, indirect, or cumulative effects to the North Fork of the Clinch River or its tributaries in the project area, or to any reaches downstream.

Butcher Fork of the Powell River

The predicted sediment increases from the proposed action are 0.7 percent over background for this watershed. No changes in stream bed composition should occur. The increase in sediment is small when compared to the background values and well within the interannual variability of the system. Aquatic habitat quality or complexity should not be reduced from sediment related to the project. There should be no measurable or observable direct, indirect, or cumulative effects to the Butcher Fork of the Powell River or its tributaries in the project area, or to any reaches downstream.

### *Cumulative Effects*

Past Actions

A private tract was clearcut in the Lovelady watershed in 2019 (Figure 5). Sediment analysis was not performed, but the area was limited in size (approximately 40 acres) and the logging infrastructure was well placed for the slope. Also, two acres of timber were cut on the Baxley Road on private property.

On Forest Service lands, timbered areas have regrown and vary from 12 to approximately 20 years old. Sedimentation from the past timber harvest where significant new roads were not constructed would have returned to near background levels after approximately five years (Croke et. al., 2001). Timber harvest areas with significant new road construction would have returned to a new normal background for the area in five to ten years; that includes differences in sedimentation and runoff resulting from the road system.

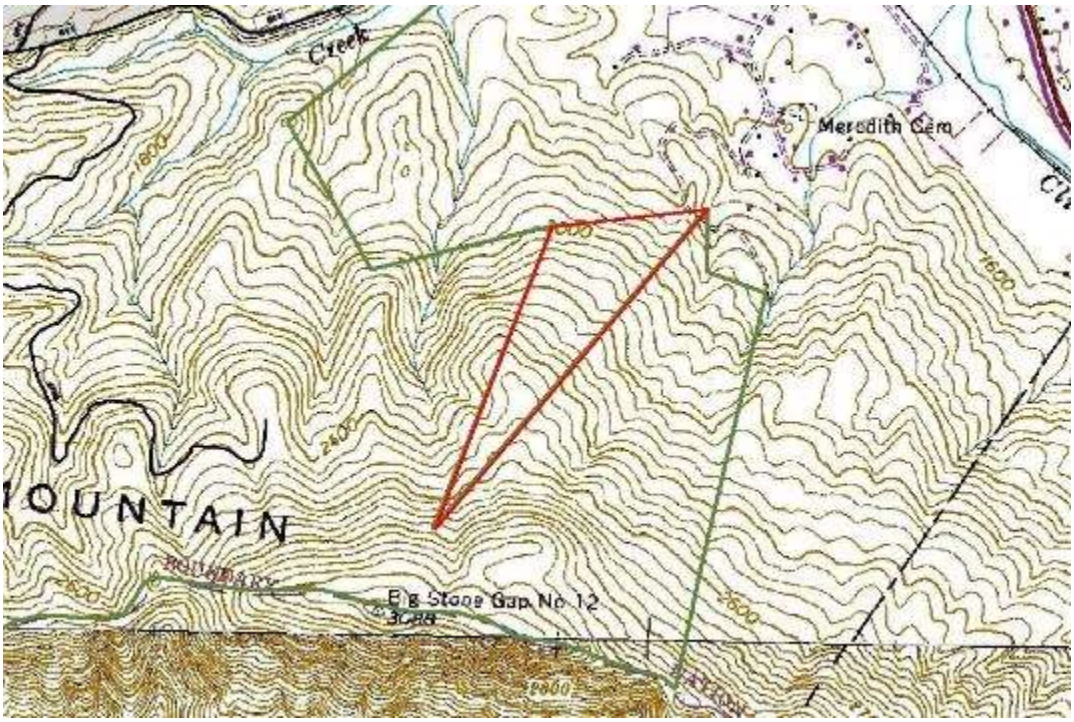


**Figure 5. Private logging tract (shown in red).**

Present Actions

Illegal ATV and full-size vehicle driving on gated roads is causing some sedimentation in the North Fork of the Clinch and Lovelady Creek watersheds in the project area. No other known activities are occurring in the project area or on adjacent private lands affecting the conditions in the watersheds.

Future Foreseeable Actions

No known future foreseeable actions are slated to occur in the project area.

Conclusion

As a result of the sediment analysis, the lower cumulative effects boundaries for discussion of effects to aquatic organisms is set at the confluence of Lovelady Creek and the North Fork of the Clinch River (NFCR) for the NFCR and on Wildcat Creek where it passes under SR 609 for the BFPR. The effects are immeasurable and indistinguishable from background levels below these points in each watershed.

### Soils Resources

This section summarizes the potential impacts of the proposed action and no action on soils resources within the project analysis area. The full analysis can be found in the *Turkey Cove Soils Report* (USDA Forest Service, 2019e).

The effects analysis for soils resources within the project area focuses on treatment areas where there is potential for soil disturbance; this is estimated to be less than 3,700 acres. Activities within these treatment areas include prescribed burns, dozer lines, and timber harvest. Disturbance areas associated with timber harvest include log landings and corridors for temporary roads and skid trails.

In the regeneration areas, there are some proposed harvest units which contain portions of soil map units with slopes exceeding 35 percent. The timber Best Management Practices in Virginia limit ground based harvest systems to slopes not exceeding 35 percent. This is more stringent than the 45 percent slope allowed in the Forest Plan and has been included as a design criteria for the project. The Forest Service has used slope as a critical factor in laying out harvest units and has avoided most of the steeper slopes.

Direct and Indirect Effects

The proposed action is expected to have both short and long-term effects to the soil resource, but not to a significant degree. The primary concern would be increased erosion associated with loamy soils and steeper slopes. Erosion can occur on long unimpeded slopes where mineral soil is exposed to raindrop impact and overland water flow; this can affect soil productivity when soil is transported offsite. Design criteria such as the use of logging slash, water bars, and establishment of vegetation to check the flow of water down the travel way can interrupt this unimpeded movement of water. State BMPs will also limit operations to areas less than 35 percent slope and avoid the erosion associated with these steep slopes. The potential for soil movement is expected to be short-term and limited to a one to three year recovery period.

Compaction is not a concern generally associated with the types of soils found within the project area as the soils are well drained, do not have perched water tables, are not prone to shrink / swell action, and have a high sand component due to the geologic parent material. Although, compaction is expected on log landings, skid roads and temporary roads.. Within harvest units, the upper few inches of soil are expected to recover quickly from harvest related compaction, except where rutting may have occurred. If an area is determined to be heavily compacted, it can be ripped and seeded to help minimize the effects of compaction, increase water infiltration and promote revegetation.

The proposed activities of chainsaw and herbicide work, road maintenance, hand line construction, and manual site preparation are not expected to have any long term effects to soil productivity. These activities will not be displacing or deeply compacting the soil occurring in these areas. Short term exposure of bare soil created by the proposed activities will be revegetated and the soil surface is not expected to erode after a recovery period.

The proposed biomass removal is not expected to have significant impacts to soil productivity since the soils in the large extent of the project area are not sensitive to soil acidification. Sensitive soils have been identified in thinning units 8, 11, and 18 and mitigations have been recommended.

It is expected that the proposed action will have long term impacts on no more than one percent of the activity area. Effects to the soils from this project are considered not significant when 85 percent of the activity area retains its pre-activity long-term soil productivity (Forest Service Handbook, R8, 2509.18.2.2, Soil Quality Standards).

Taking no action to implement treatments would maintain the status quo of conditions and trends affecting the soils resource. There would be no new soil disturbance and thus no effect.

#### Cumulative Effects

The impacts of past actions have contributed to the existing condition of the soil resources within the project area, however, no continuing impacts from past actions have been identified. There are no known present or future foreseeable actions that will impact the soil resources and overlap temporally or spatially with the Turkey Cove Ruffed Grouse Habitat Improvement Project activities.

The conclusion is that there will be no cumulative impacts from the proposed action when added to these past, present and foreseeable future management actions.

### Geology Resources

This section summarizes the potential impacts of the proposed action and no action on the geological resources within the project analysis area. The full analysis can be found in the *Turkey Cove Geology Report* (USDA Forest Service, 2019f).

The proposed action would conduct ground disturbing activities including construction of roads, log landings, and fire lines, as well as timber harvest and prescribed burns.

### Direct and Indirect Effects

Project activities have the potential to alter conditions affecting slope stability by undercutting natural slopes, diverting surface drainage, or placing excavated material (fill) on natural slopes. The alteration of conditions affecting slope stability could be sufficient to lead to slope failures, such as failures of road cut-or-fill slopes, log landing cut-or-fill slopes, or slope failures in timber harvest units or fire lines.

Excavation for roads and log landings removes support from the natural slope and leaves a cut slope that is steeper than the natural slope. Excavated material is placed on the natural slope to form a fill slope. Fill slopes are composed of loose excavated material and add weight on top of the natural slope.

The construction of roads, log landings and fire lines would alter the surface and subsurface drainage in the areas of construction and in adjacent natural slopes. Changes in surface and subsurface drainage may increase pre-existing landslide hazard and may create or contribute to failure of natural slopes. Timber harvest (tree cutting and removal) on steep slopes can alter slope stability by raising near-surface water tables and by decreasing root strength.

Potential impacts on slope stability would depend on many factors; one overarching factor and driver of potential impacts on slope stability is the steepness of the slopes where project activities would occur. Slope gradient, expressed as a percentage, is used as an indicator of potential for project activities to alter conditions affecting slope stability. The proposed management activities are on the southeast slope of Wallen Ridge, where slopes steeper than 35 percent are dispersed among the slopes less than 35 percent.

The alteration of conditions affecting slope stability could be sufficient to lead to slope failures, such as failures of road or landing cut-or-fill slopes, or slope failures in timber harvest units. Roads and log landings as part of the proposed action would have long term effects on conditions affecting slope stability whereas timber harvest and prescribed fire would have short term effects. Although, the existing road cut-and-fill slopes and past timber harvest areas in the project are generally stable. The decades of experience with the existing road system and past timber harvest in the project area suggests the proposed action would be similar in potential effects on slope stability. Resource protection measures and design criteria would reduce, but not eliminate, the potential for project-induced slope failures (landslides). Debris flows are a natural landslide hazard on the steep slopes in the project area. Where fill slopes would be constructed for roads and log landings on slopes greater than 40 percent, the alteration of conditions affecting slope stability may be sufficient at some sites to increase the potential for a fill slope failure, and possibly, a debris flow that would pose a risk to public safety, resources, and infrastructure downslope on National Forest land and non-Forest land.

Taking no action would maintain the current conditions and trends affecting slope stability from past activities. The potential effects from past activities would continue, including the potential for slope failures of road or log landings, and possibly, debris flows.

Field surveys conducted for this project have not found any sinkholes, limestone caves or other karst features. No karst features are known in the project area. The proposed action and the no action alternative would have no effect on karst and would not likely affect karst resources.

#### Cumulative Effects

The geologic process of mass wasting (landslides activity including debris flows) is part of the natural disturbance regime in the project area. Past human activities (mining; timber harvesting; roads, etc.) have altered conditions affecting slope stability in the project area, and as a result, increased the potential for slope instability.

The proposed action activities would add to the alteration of conditions affecting slope stability from past activities and would add incrementally to the potential slope instability from past human activities. Provided the roads, log landings, and fire line are properly constructed and maintained, the project is expected to have minor effects on slope stability. Effects are expected to be similar to effects from previous similar projects. No unique or unknown risks related to slope stability are expected to occur from this project. Due to the project resource protection measures, design criteria, and the spreading out of project activities in space and time (years), the impacts are not expected to be cumulatively significant.

## Social Environment

### Recreation

Recreation in the Turkey Cove Ruffed Grouse project area is dispersed in nature and includes activities such as hiking, hunting, wildlife viewing, nature viewing, and driving for pleasure. There are opportunities for dispersed backcountry camping, but there are no developed campgrounds within the project area. The project area is classified as Roaded Natural within the Recreation Opportunity Spectrum (ROS) and it has one Forest Service system trail - Wallen Ridge Trail (Trail No. 326).

The proposed activities, including timber harvest, temporary road construction, road maintenance, and prescribed fire, may create intermittent and short-term negative impacts to recreation within the project area. These would include impeding or preventing access to the area and noise disturbance as a result of equipment operation, log truck traffic, and prescribed fire operations. Noise from treatment activities can also be expected to disturb wildlife and affect viewing opportunities.

Following implementation, it is expected that the proposed treatments will enhance existing recreational opportunities. Activities that increase hard and soft mast production will lead to increased forage availability for wildlife and may therefore improve available hunting opportunities. Creating and improving early successional habitat conditions may lead to new hunting and wildlife viewing opportunities by fostering conditions for species which thrive in those habitat types. Increased soft mast production will enhance berry picking opportunities.

Temporary roads would be blocked following completion of the activities for which they were constructed and any associated administrative use to prevent unauthorized motorized access but

will also create access for non-motorized dispersed use by hikers, hunters, and those engaged in wildlife viewing. This improved access would be available short term though may be reduced over time due to natural revegetation. Improvements to system roads will enhance access opportunities by improving travel surfaces.

Taking no action to implement treatments would have no effect on recreation opportunities.

No additional timber management activities are planned to occur within the project area in the next 10 years and as such no significant cumulative effects are expected.

### Scenic Resources

This section summarizes the potential impacts of the proposed action and no action on scenic resources within the project analysis area. The full analysis can be found in the *Turkey Cove Scenic Resources Report* (USDA Forest Service, 2019g).

The analysis area for scenery includes the area visible from viewing points on travelways within and surrounding the Turkey Cove Ruffed Grouse project area. The travelways analyzed include US 23 and Alt US 58 (Concern Level 1 routes) [9], and Wallen Ridge Trail and SR 611/Lovelady Creek (Concern Level 3 routes). There are no developed recreation sites within or in the immediate vicinity of the project area. High Knob Tower, a Concern Level 1 observation site, is included in the scope of this analysis; it is located approximately 10 miles northeast of the project area.

Each proposed treatment unit was evaluated from viewpoints established on these travelways, and from the High Knob Tower. This analysis determines if the proposed action will meet the Scenic Integrity Objectives (SIOs) established in the Forest Plan or could meet them using design criteria to reduce visual contrasts created by this project to the existing landscape character.

The inventory of scenic integrity (intactness of the landscape character), distance zone, and concern level are used to derive Scenic Classes that range from 1 to 7 on the Jefferson National Forest. The Forest Plan provides direction for each management prescription area; it designates the SIOs based on the Scenic Classes. For the Turkey Cove Ruffed Grouse Habitat Improvement project area, the Scenic Classes present are 1, 2, and 5 within the Ruffed Grouse/Woodcock Habitat Emphasis (8E1) management prescription, and 1 within the Scenic Corridors (7B) management prescription.

The proposed management activities within the area of High SIO are not expected to be noticeable to the casual observer from observation points included in the analysis. They would result in some of the management activities in the Moderate SIO areas being visible and noticeable to the casual observer from locations on US 23 and potentially from points on the Wallen Ridge Trail. These will introduce additional changes in line, color and texture within the existing landscape. These changes will be more noticeable during leaf-on seasons, and will be

[9] Concern levels are a measure of people's concern for the scenic quality of the National Forests. Level 1 is the highest concern, Level 3 is the lowest. (USDA Forest Service, 1995)

more noticeable during times of the day that longer shadows are cast around the edges of new openings. The openings will also be more noticeable when there is snow or very heavy frost on the ground.

The planned scale (size, number, spacing), shapes, and in some instances the orientation and aspect to the viewer, will assure that the new openings introduced by management activities would mimic and blend with the existing visible alterations, and not begin to dominate the landscape character. Through the appropriate application of Forest Plan guidance and project-specific design criteria such as retention trees, it can be reasonably concluded that there will be no significant effects on scenic resources from the proposed action. Taking no action to implement treatments would have no effect on scenic resources.

All cumulative actions meet the SIOs of the area. No significant cumulative impacts to the visual resource are expected to result from this action coupled with past and reasonably foreseeable actions in the viewshed

### Roads

This section summarizes the potential impacts of the proposed action and no action on roads and access within the project analysis area. The full analysis can be found in the *Turkey Cove Roads Report* (USDA Forest Service, 2019h).

Forest Service roads that are open to public use are counted toward the calculation of open road density (miles of roads per square mile of area). The Forest Plan objective for the project area is to maintain an open road density at or below 1.5 miles per square mile; the current open road density for this is 1.02 miles per square mile. A pre-project review of the on-the-ground conditions identified four existing roads that need to be added to the Forest Service roads database. This will be done as an administrative correction, and these roads will be assigned FSR road numbers.

The system roads that would be used during commercial vegetation management activities are in fair condition and at acceptable grades. In addition, approximately 1.3 miles of temporary road will be constructed to access timber locations and will be removed once treatments are completed.

#### Direct and Indirect Effects

Forest System Roads FSR 641, FSR 2764 and FSR 2764A provide access to the proposed treatment areas and would receive maintenance under the proposed action. This includes brushing, ditch pulling, blading, culvert replacement, and gravel placement. Some improvements, in the form of turn widening, upsizing culverts where needed, and realignment as necessary, are anticipated to accommodate logging trucks.

Approximately 1.3 miles of temporary roads would be constructed to implement the vegetation management treatments; it is expected that these could contribute to increased runoff and sedimentation in the short-term. The project design criteria, Forest Plan guidance, and Virginia Best Management Practices are designed to minimize and mitigate these impacts. No significant

impacts are anticipated from either the construction of temporary roads or the maintenance associated with the use of existing system roads.

Taking no action to implement treatments would avoid the construction the temporary roads within the project area. But no action would also forgo additional maintenance on 12.14 miles of existing system roads within the project area and continue current conditions and trends affecting these roads.

### Cumulative Effects

No significant effects are expected from the proposed action, and no additional timber management activities are planned to occur within the project area in the next 10 years. The cumulative effect of the proposed action would not be significant.

## Economics

### Scope of the Analysis

The spatial scope of the economic analysis includes the area within a 60-mile radius of the Turkey Cove Ruffed Grouse Habitat Improvement project area. Sixty miles is a common limit for hauling of timber and/or roundwood. The temporal scope will be limited to the life of the various timber sales developed from the project. In addition, the scope of the economic analysis is limited to a comparison of the expenditures and revenues associated with the commercial timber sale components of the project.

It is important to note that not all effects can be quantified monetarily. The benefits and costs of a proposed management action on wildlife, soil, water, visuals, recreation or other non-market resources cannot be quantified in a single dollar amount. There is no single accepted methodology for such an evaluation, and it is beyond the scope of this analysis.

**Table 16. Economic Efficiency**

| Economic Comparison | Proposed Action | No action |
|---|---|---|
| Timber Volume, *Total (CCF)* | 16,540 | 0 |
| Volume, *Per Acre (CCF)* | 20 | 0 |
| Stumpage Value, *Per ccf* | $ 32.44 | $ - |
| Stumpage Value, *Total* | $ 539,801.60 | $ - |
| Coordination/Planning | $ (532,480.00) | $ (532,480.00) |
| Sale Preparation Costs | $ (266,240.00) | $ - |
| Sale Administration Costs | $ (116,480.00) | $ - |
| Economic Efficiency | $ (375,398.40) | $ (532,480.00) |
| Value Added, Virginia's Economy [10] | $ 879,876.61 | $ - |

Existing Conditions

There are three sawmills, two pulpwood concentration yards, and one mulch incinerator for power generation located within a 60-mile radius of the area. These outlets are important centers of employment and revenue for the area and generate a secure demand for timber products.

The project area is located in a region that is primarily rural in character. Since 1990, the year of peak coal production in Virginia, the output of coalmines has steadily declined as the more accessible coal deposits have been mined out. This is in despite of Virginia's high quality coal increasing in value in more recent years. The Clinch Ranger District lies within the Southwest Coalfield which is the largest contiguous Coal-Field Region in the state. With coal steadily declining across the state, this region has been hit exceptionally hard. Local communities are working to increase economic opportunities to help fill the void of displaced coal jobs. This has led to city and town managers, along with several interest groups in the area, to look hard at the JNF for potential answers. Although not a comprehensive solution for the regional economic issues, two potential economic opportunities for this region are from dollars generated from recreation and timber management activities within this region's national forests.

There is one paper mill in the tri-cities area that uses pine and hardwood pulpwood and several sawmills and a fibermill within a 60-mile radius of the project area. Several local mills use National Forest timber as a source of raw material. In September of 2018, a meeting was held with local timber professionals and the National Forest. Comments received during this meeting indictaed that demand for sawtimber and pulpwood products is high within the defined 60-mile radius surrounding the proposed activities and that the demand for sawtimber from National Forest lands generally outpaces the supply.These mills provide an important source of

[10] $1.63 of value is added to Virginia's economy for every dollar of timber sold. (Rephann, 2013)

employment and revenues for the area. Local monetary benefits arise primarily from harvesting, primary processing, and transportation.

In a 2013 report on the *Economic Impacts of Agriculture and Forest Industries in Virginia* (Rephann, 2013), it was found that, every job created in forestry-related industries in the Virginia economy produces 1.6 other jobs in Virginia. Every dollar generated in the agriculture and forestry-related industries results in another $1.63 value-added in the Virginia economy. The forestry sector alone in Virginia has a total impact of over $17 billion in total industry output, approximately 103,800 jobs, and $8.8 billion in Value-added. In an attempt to quantify the social economic benefits of ecological services provided by the forestland in Virginia, a value transfer approach was used to determine that the Commonwealth receives $6.385 billion in estimated air and water environmental services value from forestry each year (Rephann, 2013).

### Direct and Indirect Effects

The above economic efficiency table presents the costs and returns associated with the alternatives. The values presented are estimates based on the most recent stumpage and unit cost estimates of activities on the Forest. The numbers given do not represent the actual numbers that will be found under any given alternative, but rather show the relative change between alternatives for comparison purposes.

#### *Proposed Action*

The Net Present Value of the proposed action is $235.97/acre. Approximately $539,802 in stumpage would be directly generated by the proposed action. This would result in a value added benefit of about $879,877 to the Virginia economy.

#### *No Action*

The Net Present Value of no action is $0/acre due to no revenue being generated. It's estimated that approximately $532,480 would be spent on planning and coordination. No income would be directly generated and no value-added benefit to the larger Virginia economy would result.

### Cumulative Effects

Thirty sales are currently active on the George Washington and Jefferson National Forests (GWJNFs). It is also estimated that 45 additional sales could occur within this area over the next two to three years - the average length of a Forest Service timber sale. The number of sales and quantity of timber currently under contract or soon to be available on privately held lands is unknown, but is expected to be at least equivalent to the volume from National Forest land, if not more. Current and future timber sales on National Forest land are expected to be quite similar to sales planned in the Nettle Patch project area in terms of economic costs and benefits. Combined benefits from these cumulative actions would result in monies benefiting the counties, Federal Treasury, and indirect secondary benefits to the surrounding communities.

Impacts of Forest Service timber sales on privately held timber sales are expected to be minimal. NFS timber potentially provides about ten percent of the demand in the market area of the

GWJNFs and in actual practice we have provided much less than that. Thus, the impact of this and other cumulative timber sale activity on the supply side of the economic situation is negligible. Ultimately, the price of National Forest timber is established by the market through a competitive bidding process. Timber sales on the Ranger Districts within the 60 mile radius of this sale usually receive one or two bids per sale. Competition is fair. Therefore, National Forest timber sales are not expected to “undercut” the value of the timber market or privately held timber values.

## Finding of No Significant Impact

The responsible official is responsible for evaluating the effects of the project relative to the definition of significance established by the CEQ Regulations (40 CFR 1508.13). Following review and consideration of the EA and documentation included in the project record, the responsible official determined that the proposed action (Alternative 1) and Alternative 2 (No Action) will not have a significant effect on the quality of the human environment. As a result, no environmental impact statement will be prepared. Rationale for this finding is as follows, organized by sub-section of the CEQ definition of significance cited above.

### Context

For the proposed action, the context of the environmental effects is based on the environmental analysis in this EA. The Turkey Cove Ruffed Grouse Habitat Improvement Project area covers approximately 4,730 located directly southwest of the town of Big Stone Gap, Virginia. Some of the project's effects, such as smoke from prescribed fire, noise from machinery, and additional traffic will be experienced beyond the project boundary. However few, if any, effects will be noticeable or measureable beyond the localized vicinity. Both short-term and long-term effects of the proposed action were found to be of limited extent and are not expected to affect national resources or the human environment. The project was designed to minimize environmental effects through various measures as described in the *Design Criteria and Resource Protection Measures* section of this EA.

This decision is consistent with similar activities implemented in the past by the George Washington and Jefferson National Forests (GW-Jeff NFs), which trend toward achieving the desired conditions in the Forest Plan, while meeting the purpose and need of the EA. The project does not have international, national, regional, or state-wide importance. The physical and biological effects of the selected actions were analyzed at appropriate scales, such as within the project area, adjacent to the project area, or across a larger landscape.

### Intensity

Intensity is a measure of the severity, extent, or quantity of effects, and is based on information from the effects analysis of this EA and the references in the project record. The effects of this project have been appropriately and thoroughly considered with an analysis that is responsive to concerns and issues raised by the public. The agency has taken a hard look at the environmental effects using relevant scientific information and knowledge of site-specific conditions gained from field visits. My finding of no significant impact is based on the context of the project and intensity of effects using the ten factors identified in 40 CFR 1508.27(b).

1. **Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.**

   The interdisciplinary team analyzed the direct, indirect, and cumulative effects of the proposed action on biological, physical, and cultural resources in and around the project area. As disclosed in the *Environmental Effects* section of this EA, all adverse impacts are minor and of low intensity. Design features have been agreed upon by the

interdisciplinary team to ensure that even short-term impacts to these resources will not be significant.

These analyses contribute to the understanding of the effects of the proposed action and confirm that there will be no significant impacts to those resources. Beneficial effects were not used to counterbalance adverse impacts in determining the significance of impacts on the environment. Consideration of the intensity of environmental effects is not biased by beneficial effects of the action.

**2. The degree to which the proposed action affects public health or safety.**

There will be no significant effects on public health and safety because all safety precautions will be followed, including signs and notices during project operations, and restrictions on access when required. Public notifications will be made for planned prescribed fires so that residents may take precautions to avoid smoke inhalation. Workers will wear protective equipment and clothing and will follow Forest Service safety requirements.

**3. Unique characteristics of the geographic area such as the proximity to historical or cultural resources, parklands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.**

There will be no significant effects on unique characteristics of the area. There are no parklands, prime farmlands, wild and scenic rivers, or ecologically critical areas affected by the project.

Wetlands within treatment areas will be identified before implementation and a streamside management zone will be designated around all wetlands. Direct and indirect effects for all resource indicators show that minor effects to wetland resources will occur. These effects are expected to be localized in nature, and monitoring pre/post implementation will not likely show a discernable change in the resource conditions as appropriate Forest Plan standards and guidelines and resource protection measures would be implemented.

There will be no significant effects on unique characteristics such as historical or cultural resources when the recommended resource protection measures are implemented prior to and during the proposed treatments. The Forest Archaeologist may also approve additional measures to further protect sites.

**4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.**

The effects on the quality of the human environment are not likely to be highly controversial. There is no credible (based on location and scope of actions) scientific controversy over the impacts of the proposed decision; the best available science was considered in making this decision. Effects analysis was conducted using scientific literature cited in the *References* section of this EA and the interdisciplinary team

reviewed literature cited in public comments on the project. The proposed action with the identified resource protection measures meets Forest Plan direction.

5. **The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.**

   The Agency has considerable experience with projects that are similar to the proposed action. Analysis of the proposed action considered the effects of past actions as a frame of reference, in conjunction with scientifically accepted analytical techniques, available information, and best professional experience and judgment, to estimate effects to the human environment. This analysis shows the effects are not uncertain, and do not involve unique or unknown risk.

6. **The degree to which the action may establish precedent for future actions with significant effects or represents a decision in principle about a future consideration.**

   The proposed activities are similar in nature and effects to many other projects in the immediate area and are consistent with the Forest Plan. This action does not represent a decision in principle about a future consideration. Any proposed future project must be evaluated on its own merits and effects. The action does not establish a precedent for future actions with significant effects because the project is an independent action that has no bearing on any other actions.

7. **Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.**

   The cumulative impacts to each resource have been fully analyzed and were not found to be significant. Past, present, and reasonably foreseeable activities that may be relevant to the cumulative effects analysis for each resource were evaluated by each specialist to determine which actions were relevant to their analysis. The individual specialist reports and the analysis in this EA indicate that there will be no significant cumulative effects.

8. **The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.**

   There are no districts, sites, highways, structures, or objects listed on or eligible for the National Register of Historic Places within the Turkey Cove project area. Resource protection measures will be implemented so that no loss or destruction of significant scientific, cultural, or historic resources will occur.

**9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.**

A biological assessment has been prepared to document the effects of the proposed action on threatened and endangered aquatic and terrestrial wildlife species. Consultation with the U.S. Fish and Wildlife Service (USFWS) has been initiated and will occur simultaneously with the objection period. A final decision for this project will not be made until all required consultation with the USFWS has been completed. Additional monitoring and/or mitigations may be instituted for threatened or endangered species based on coordination with the USFWS. The Forest Service will comply with any conservation measures resulting from this consultation process and the findings will be documented in the final decision notice.

The biological assessment concluded that the project:

- Indiana bat - This project may affect the Indiana bat; however, there are no effects beyond those previously disclosed in the Biological Assessment dated August 19, 2003 during formal consultation of Forest Plan activities with the USFWS, which resulted in a Biological Opinion (BO) and Incidental Take provisions. This project is covered under the Forest Plan and is outside the primary and secondary cave protection areas for Indiana bats. Since the implementation of this project will be in compliance with the BO, adheres to Forest Plan standards designed for the protection of the Indiana bat, is within annual Incidental Take provisions, is not within 2 miles of known hibernacula and/or maternity colonies, or within ¼ mile of known individual roost trees, further Section 7 consultation is not necessary for the Indiana bat, according to the USFWS BO terms and conditions 2(a) and (b).

- Northern long-eared bat - This project may affect the northern long-eared bat; however, there are no effects beyond those previously disclosed in the programmatic biological opinion on implementing the final 4(d) rule dated January 5, 2016. Any taking that may occur incidental to this project is not prohibited under the final 4(d) rule (50 CFR §17.40(o)) issued on January 14, 2016. This project is consistent with the Forest Plan, the description of the proposed action in the programmatic biological opinion, and all project activities are excepted since they are more than ¼ mile from a known hibernaculum and more than 150 feet from known occupied maternity roost trees.

- Will have **no effect** on spotfin chub (*Cyprinella monacha*), yellowfin madtom (*Noturus flavipinnis*), or slender chub (*Erimystax cahni*) critical habitat in the mainstem Clinch and Powell Rivers.

- Will have **no effect** on the fluted kidneyshell (*Ptychobranchus subtentum*), rough rabbitsfoot (*Quadrula cylindrical*), oyster mussel (*Epioblasma capsaeformis*), Cumberlandian combshell (*Epioblasma brevidens*), slabside pearlymussel (*Pleuronaia dolabelloides*), or purple bean (*Villosa perpurpurea*) critical habitat in the mainstem Clinch and Powell Rivers.

**10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.**

The action will not violate Federal, State, and local laws or requirements for the protection of the environment. Applicable laws and regulations that were considered in the EA include Virginia's Department of Environmental Quality regulations for air and water quality monitoring and protection, the Clean Air Act, the Clean Water Act, the Endangered Species Act, and the National Historic Preservation Act. Each of these is discussed in the relevant resource specialist's report. The action is also consistent with the Forest Plan.

# Project Consultation and Coordination

## A. Agencies & Organizations Consulted

The Forest Service consulted the following Federal, state, and local agencies and organizations during the development of this Environmental Assessment:

- Eastern Band of Cherokee Indians
- Cherokee Nation
- United Keetoowah Band of Cherokee
- U.S. Fish and Wildlife Service, Southwest Virginia and Virginia Field Offices
- Virginia Department of Game and Inland Fisheries
- Virginia Department of Conservation & Recreation, Division of Natural Heritage

## B. Forest Service Interdisciplinary Team Members

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